

SEQUENCE LISTING

<110> ffrench-Constant, Richard

Waterfield, Nicholas

<120> DNA Sequences from tcd Genomic Region of *Photorhabdus luminescens*

<130> 62878

<160> 16

<170> PatentIn version 3.0

<210> 1

<211> 7551

<212> DNA

<213> *Photorhabdus luminescens*

<220>

<221> CDS

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Gly Phe Asn Cys Leu Thr Asp Ile Ser His Ser Ser Phe Asn Glu Phe	
20 25 30	

cgc cag caa gta tct gag cac ctc tcc tgg tcc gaa aca cac gac tta	144
Arg Gln Gln Val Ser Glu His Leu Ser Trp Ser Glu Thr His Asp Leu	
35 40 45	

tat cat gat gca caa cag gca caa aag gat aat cgc ctg tat gaa gcg	192
Tyr His Asp Ala Gln Gln Ala Gln Lys Asp Asn Arg Leu Tyr Glu Ala	
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cgt att ctc aaa cgc gcc aat ccc caa tta caa aat gcg gtg cat ctt	240
Arg Ile Leu Lys Arg Ala Asn Pro Gln Leu Gln Asn Ala Val His Leu	
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Ala Ile Leu Ala Pro Asn Ala Glu Leu Ile Gly Tyr Asn Asn Gln Phe	
85 90 95	

agc ggt aga gcc agt caa tat gtt gcg ccg ggt acc gtt tct tcc atg	336
Ser Gly Arg Ala Ser Gln Tyr Val Ala Pro Gly Thr Val Ser Ser Met	
100 105 110	

ttc tcc ccc gcc gct tat ttg act gaa ctt tat cgt gaa gca cgc aat	384
Phe Ser Pro Ala Ala Tyr Leu Thr Glu Leu Tyr Arg Glu Ala Arg Asn	
115 120 125	

tta cac gca agt gac tcc gtt tat tat ctg gat acc cgc cgc cca gat	432
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Leu	His	Ala	Ser	Asp	Ser	Val	Tyr	Tyr	Leu	Asp	Thr	Arg	Arg	Pro	Asp	
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Leu	Lys	Ser	Met	Ala	Leu	Ser	Gln	Gln	Asn	Met	Asp	Ile	Glu	Leu	Ser	
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aca	ctc	tct	ttg	tcc	aat	gag	ctg	tta	ttg	gaa	agc	att	aaa	act	gaa	528
Thr	Leu	Ser	Leu	Ser	Asn	Glu	Leu	Leu	Glu	Ser	Ile	Lys	Thr	Glu		
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Arg	Pro	Ser	Gly	Ala	Thr	Pro	Tyr	His	Asp	Ala	Tyr	Glu	Asn	Val	Arg	
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Pro Gln Val Asn Ile Glu Tyr Ser Ala Asn Ile Thr Leu Asn Thr Ala			
385	390	395	400
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Asp Ile Ser Gln Pro Phe Glu Ile Gly Leu Thr Arg Val Leu Pro Ser			
405	410	415	
ggt tct tgg gca tat gcc gcc gca aaa ttt acc gtt gaa gag tat aac			1296
Gly Ser Trp Ala Tyr Ala Ala Lys Phe Thr Val Glu Glu Tyr Asn			
420	425	430	
caa tac tct ttt ctg cta aaa ctt aac aag gct att cgt cta tca cgt			1344
Gln Tyr Ser Phe Leu Leu Lys Leu Asn Lys Ala Ile Arg Leu Ser Arg			
435	440	445	
gcg aca gaa ttg tca ccc acg att ctg gaa ggc att gtg cgc agt gtt			1392
Ala Thr Glu Leu Ser Pro Thr Ile Leu Glu Gly Ile Val Arg Ser Val			
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aat cta caa ctg gat atc aac aca gac gta tta ggt aaa gtt ttt ctg			1440
Asn Leu Gln Leu Asp Ile Asn Thr Asp Val Leu Gly Lys Val Phe Leu			
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act aaa tat tat atg cag cgt tat gct att cat gct gaa act gcc ctg			1488
Thr Lys Tyr Tyr Met Gln Arg Tyr Ala Ile His Ala Glu Thr Ala Leu			
485	490	495	
ata cta tgc aac gcg cct att tca caa cgt tca tat gat aat caa cct			1536
Ile Leu Cys Asn Ala Pro Ile Ser Gln Arg Ser Tyr Asp Asn Gln Pro			
500	505	510	
agc caa ttt gat cgc ctg ttt aat acg cca tta ctg aac gga caa tat			1584
Ser Gln Phe Asp Arg Leu Phe Asn Thr Pro Leu Leu Asn Gly Gln Tyr			
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ttt tct acc ggc gat gag gag att gat tta aat tca ggt agc acc ggc			1632
Phe Ser Thr Gly Asp Glu Glu Ile Asp Leu Asn Ser Gly Ser Thr Gly			
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gat tgg cga aaa acc ata ctt aag cgt gca ttt aat att gat gat gtc			1680
Asp Trp Arg Lys Thr Ile Leu Lys Arg Ala Phe Asn Ile Asp Asp Val			
545	550	555	560
tcg ctc ttc cgc ctg ctt aaa att acc gac cat gat aat aaa gat gga			1728
Ser Leu Phe Arg Leu Leu Lys Ile Thr Asp His Asp Asn Lys Asp Gly			
565	570	575	
aaa att aaa aat aac cta aag aat ctt tcc aat tta tat att gga aaa			1776
Lys Ile Lys Asn Asn Leu Lys Asn Leu Ser Asn Leu Tyr Ile Gly Lys			
580	585	590	
tta ctg gca gat att cat caa tta acc att gat gaa ctg gat tta tta			1824
Leu Leu Ala Asp Ile His Gln Leu Thr Ile Asp Glu Leu Asp Leu Leu			
595	600	605	
ctg att gcc gta ggt gaa gga aaa act aat tta tcc gct atc agt gat			1872
Leu Ile Ala Val Gly Glu Gly Lys Thr Asn Leu Ser Ala Ile Ser Asp			
610	615	620	
aag caa ttg gct acc ctg atc aga aaa ctc aat act att acc agc tgg			1920
Lys Gln Leu Ala Thr Leu Ile Arg Lys Leu Asn Thr Ile Thr Ser Trp			
625	630	635	640
cta cat aca cag aag tgg agt gta ttc cag cta ttt atc atg acc tcc			1968

Leu His Thr Gln Lys Trp Ser Val Phe Gln Leu Phe Ile Met Thr Ser	645	650	655	
acc agc tat aac aaa acg cta acg cct gaa att aag aat ttg ctg gat				2016
Thr Ser Tyr Asn Lys Thr Leu Thr Pro Glu Ile Lys Asn Leu Leu Asp	660	665	670	
acc gtc tac cac ggt tta caa ggt ttt gat aaa gac aaa gca gat ttg				2064
Thr Val Tyr His Gly Leu Gln Gly Phe Asp Lys Asp Lys Ala Asp Leu	675	680	685	
cta cat gtc atg gcg ccc tat att gcg gcc acc ttg caa tta tca tcg				2112
Leu His Val Met Ala Pro Tyr Ile Ala Ala Thr Leu Gln Leu Ser Ser	690	695	700	
gaa aat gtc gcc cac tcg gta ctc ctt tgg gca gat aag tta cag ccc				2160
Glu Asn Val Ala His Ser Val Leu Leu Trp Ala Asp Lys Leu Gln Pro	705	710	715	720
ggc gac ggc gca atg aca gca gaa aaa ttc tgg gac tgg ttg aat act				2208
Gly Asp Gly Ala Met Thr Ala Glu Lys Phe Trp Asp Trp Leu Asn Thr	725	730	735	
aag tat acg ccg ggt tca tcg gaa gcc gta gaa acg cag gaa cat atc				2256
Lys Tyr Thr Pro Gly Ser Ser Glu Ala Val Glu Thr Gln Glu His Ile	740	745	750	
gtt cag tat tgt cag gct ctg gca caa ttg gaa atg gtt tac cat tcc				2304
Val Gln Tyr Cys Gln Ala Leu Ala Gln Leu Glu Met Val Tyr His Ser	755	760	765	
acc ggc atc aac gaa aac gcc ttc cgt cta ttt gtg aca aaa cca gag				2352
Thr Gly Ile Asn Glu Asn Ala Phe Arg Leu Phe Val Thr Lys Pro Glu	770	775	780	
atg ttt ggc gct gca act gga gca gcg ccc gcg cat gat gcc ctt tca				2400
Met Phe Gly Ala Ala Thr Gly Ala Ala Pro Ala His Asp Ala Leu Ser	785	790	795	800
ctg att atg ctg aca cgt ttt gcg gat tgg gtg aac gca cta ggc gaa				2448
Leu Ile Met Leu Thr Arg Phe Ala Asp Trp Val Asn Ala Leu Gly Glu	805	810	815	
aaa gcg tcc tcg gtg cta gcg gca ttt gaa gct aac tcg tta acg gca				2496
Lys Ala Ser Ser Val Leu Ala Ala Phe Glu Ala Asn Ser Leu Thr Ala	820	825	830	
gaa caa ctg gct gat gcc atg aat ctt gat gct aat ttg ctg ttg caa				2544
Glu Gln Leu Ala Asp Ala Met Asn Leu Asp Ala Asn Leu Leu Leu Gln	835	840	845	
gcc agt att caa gca caa aat cat caa cat ctt ccc cca gta act cca				2592
Ala Ser Ile Gln Ala Gln Asn His Gln His Leu Pro Pro Val Thr Pro	850	855	860	
gaa aat gcg ttc tcc tgt tgg aca tct atc aat act atc ctg caa tgg				2640
Glu Asn Ala Phe Ser Cys Trp Thr Ser Ile Asn Thr Ile Leu Gln Trp	865	870	875	880
gtt aat gtc gca caa caa ttg aat gtc gcc cca cag ggc gtt tcc gct				2688
Val Asn Val Ala Gln Gln Leu Asn Val Ala Pro Gln Gly Val Ser Ala	885	890	895	
ttg gtc ggg ctg gat tat att caa tca atg aaa gag aca ccg acc tat				2736

Leu Val Gly Leu Asp Tyr Ile Gln Ser Met Lys Glu Thr Pro Thr Tyr			
900	905	910	
gcc cag tgg gaa aac gcg gca ggc gta tta acc gcc ggg ttg aat tca		2784	
Ala Gln Trp Glu Asn Ala Ala Gly Val Leu Thr Ala Gly Leu Asn Ser			
915	920	925	
caa cag gct aat aca tta cac gct ttt ctg gat gaa tct cgc agt gcc		2832	
Gln Gln Ala Asn Thr Leu His Ala Phe Leu Asp Glu Ser Arg Ser Ala			
930	935	940	
gca tta agc acc tac tat atc cgt caa gtc gcc aag gca gcg gcg gct		2880	
Ala Leu Ser Thr Tyr Ile Arg Gln Val Ala Lys Ala Ala Ala Ala			
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att aaa agc cgt gat gac ttg tat caa tac tta ctg att gat aat cag		2928	
Ile Lys Ser Arg Asp Asp Leu Tyr Gln Tyr Leu Leu Ile Asp Asn Gln			
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gtt tct gcg gca ata aaa acc acc cggt atc gcc gaa gcc att gcc agt		2976	
Val Ser Ala Ala Ile Lys Thr Thr Arg Ile Ala Glu Ala Ile Ala Ser			
980	985	990	
att caa ctg tac gtc aac cggt gca ttg gaa aat gtg gaa gaa aat gcc		3024	
Ile Gln Leu Tyr Val Asn Arg Ala Leu Glu Asn Val Glu Glu Asn Ala			
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Asn Ser Gly Val Ile Ser Arg Gln Phe Phe Ile Asp Trp Asp Lys			
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Tyr Asn Lys Arg Tyr Ser Thr Trp Ala Gly Val Ser Gln Leu Val			
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tac tac ccg gaa aac tat att gat ccg acc atg cgt atc gga caa		3159	
Tyr Tyr Pro Glu Asn Tyr Ile Asp Pro Thr Met Arg Ile Gly Gln			
1040	1045	1050	
acc aaa atg atg gac gca tta ctg caa tcc gtc agc caa agc caa		3204	
Thr Lys Met Met Asp Ala Leu Leu Gln Ser Val Ser Gln Ser Gln			
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tta aac gcc gat acc gtc gaa gat gcc ttt atg tct tat ctg aca		3249	
Leu Asn Ala Asp Thr Val Glu Asp Ala Phe Met Ser Tyr Leu Thr			
1070	1075	1080	
tcg ttt gaa caa gtg gct aat ctt aaa gtt att agc gca tat cac		3294	
Ser Phe Glu Gln Val Ala Asn Leu Lys Val Ile Ser Ala Tyr His			
1085	1090	1095	
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Asp Asn Ile Asn Asn Asp Gln Gly Leu Thr Tyr Phe Ile Gly Leu			
1100	1105	1110	
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Ser Glu Thr Asp Ala Gly Glu Tyr Tyr Trp Arg Ser Val Asp His			
1115	1120	1125	
agt aaa ttc aac gac ggt aaa ttc gcg gct aat gcc tgg agt gaa		3429	
Ser Lys Phe Asn Asp Gly Lys Phe Ala Ala Asn Ala Trp Ser Glu			
1130	1135	1140	
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Gln	Thr	Glu	Thr	Asp	Tyr	Arg	Tyr	Glu	Leu	Lys	Leu	Ala	His	Ile	
1190						1195					1200				
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Phe	Tyr	Asn	Gln	Gln	Asp	Thr	Leu	Asp	Ser	Tyr	Lys	Asn	Ala	Ser	
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Trp	Gly	Asp	Tyr	Tyr	Leu	Ser	Met	Val	Tyr	Asn	Gly	Asp	Ile	Pro	
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Thr	Tyr	Pro	Ser	Lys	Val	Glu	Ala	Trp	Ile	Pro	Gly	Ala	Lys	Arg	
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Ser	Leu	Thr	Asn	Gln	Asn	Ala	Ala	Ile	Gly	Asp	Asp	Tyr	Ala	Thr	
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Asp	Ser	Leu	Asn	Lys	Pro	Asp	Asp	Leu	Lys	Gln	Tyr	Ile	Phe	Met	
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Thr	Asp	Ser	Lys	Gly	Thr	Ala	Thr	Asp	Val	Ser	Gly	Pro	Val	Glu	
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Ile	Asn	Thr	Ala	Ile	Ser	Pro	Ala	Lys	Val	Gln	Ile	Ile	Val	Lys	
1490						1495					1500				
gcg	ggt	ggc	aag	gag	caa	act	ttt	acc	gca	gat	aaa	gat	gtc	tcc	4554
Ala	Gly	Gly	Lys	Glu	Gln	Thr	Phe	Thr	Ala	Asp	Lys	Asp	Val	Ser	
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Asp	Phe	Ser	Gly	Ala	Asn	Ser	Leu	Tyr	Phe	Trp	Glu	Leu	Phe	Tyr	
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Tyr	Thr	Pro	Met	Leu	Val	Ala	Gln	Arg	Leu	Leu	His	Glu	Gln	Asn	
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Phe	Asp	Glu	Ala	Asn	Arg	Trp	Leu	Lys	Tyr	Val	Trp	Ser	Pro	Ser	
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Pro	Ile	Tyr	Ala	Thr	Pro	Ala	Asp	Pro	Lys	Ala	Leu	Leu	Ser	Ala	
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Gly Phe Asn Cys Leu Thr Asp Ile Ser His Ser Ser Phe Asn Glu Phe															
20				25							30				
Arg Gln Gln Val Ser Glu His Leu Ser Trp Ser Glu Thr His Asp Leu															

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Tyr His Asp Ala Gln Gln	Ala Gln Lys Asp Asn Arg	Leu Tyr Glu Ala	
50	55	60	
Arg Ile Leu Lys Arg Ala Asn Pro Gln	Leu Gln Asn Ala Val His	Leu	
65	70	75	80
Ala Ile Leu Ala Pro Asn Ala Glu	Leu Ile Gly Tyr Asn Asn Gln Phe		
85	90	95	
Ser Gly Arg Ala Ser Gln Tyr Val	Ala Pro Gly Thr Val Ser Ser Met		
100	105	110	
Phe Ser Pro Ala Ala Tyr Leu Thr	Glu Leu Tyr Arg Glu Ala Arg Asn		
115	120	125	
Leu His Ala Ser Asp Ser Val	Tyr Tyr Leu Asp Thr Arg Arg Pro Asp		
130	135	140	
Leu Lys Ser Met Ala Leu Ser	Gln Gln Asn Met Asp Ile Glu Leu Ser		
145	150	155	160
Thr Leu Ser Leu Ser Asn Glu	Leu Leu Leu Glu Ser Ile Lys Thr Glu		
165	170	175	
Ser Lys Leu Glu Asn Tyr Thr	Lys Val Met Glu Met Leu Ser Thr Phe		
180	185	190	
Arg Pro Ser Gly Ala Thr Pro	Tyr His Asp Ala Tyr Glu Asn Val Arg		
195	200	205	
Glu Val Ile Gln Leu Gln Asp	Pro Gly Leu Glu Gln Leu Asn Ala Ser		
210	215	220	
Pro Ala Ile Ala Gly Leu Met	His Gln Ala Ser Leu Leu Gly Ile Asn		
225	230	235	240
Ala Ser Ile Ser Pro Glu Leu Phe	Asn Ile Leu Thr Glu Glu Ile Thr		
245	250	255	
Glu Gly Asn Ala Glu Glu Leu Tyr	Lys Lys Asn Phe Gly Asn Ile Glu		
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Pro Ala Ser Leu Ala Met Pro	Glu Tyr Leu Lys Arg Tyr Tyr Asn Leu		
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Ser Asp Glu Glu Leu Ser Gln	Phe Ile Gly Lys Ala Ser Asn Phe Gly		
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Gln Gln Glu Tyr Ser Asn Asn	Gln Leu Ile Thr Pro Val Val Asn Ser		
305	310	315	320
Ser Asp Gly Thr Val Lys Val	Tyr Arg Ile Thr Arg Glu Tyr Thr Thr		
325	330	335	
Asn Ala Tyr Gln Met Asp Val	Glu Leu Phe Pro Phe Gly Gly Glu Asn		
340	345	350	
Tyr Arg Leu Asp Tyr Lys Phe	Lys Asn Phe Tyr Asn Ala Ser Tyr Leu		
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Ser Ile Lys Leu Asn Asp Lys	Arg Glu Leu Val Arg Thr Glu Gly Ala		
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Pro Gln Val Asn Ile Glu Tyr Ser Ala Asn Ile Thr Leu Asn Thr Ala
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 Asp Ile Ser Gln Pro Phe Glu Ile Gly Leu Thr Arg Val Leu Pro Ser
 405 410 415
 Gly Ser Trp Ala Tyr Ala Ala Lys Phe Thr Val Glu Glu Tyr Asn
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 Gln Tyr Ser Phe Leu Leu Lys Leu Asn Lys Ala Ile Arg Leu Ser Arg
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 Ala Thr Glu Leu Ser Pro Thr Ile Leu Glu Gly Ile Val Arg Ser Val
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 Phe Ser Thr Gly Asp Glu Glu Ile Asp Leu Asn Ser Gly Ser Thr Gly
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 Ser Leu Phe Arg Leu Leu Lys Ile Thr Asp His Asp Asn Lys Asp Gly
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 Leu Leu Ala Asp Ile His Gln Leu Thr Ile Asp Glu Leu Asp Leu Leu
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 610 615 620
 Lys Gln Leu Ala Thr Leu Ile Arg Lys Leu Asn Thr Ile Thr Ser Trp
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 Leu His Thr Gln Lys Trp Ser Val Phe Gln Leu Phe Ile Met Thr Ser
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 Thr Ser Tyr Asn Lys Thr Leu Thr Pro Glu Ile Lys Asn Leu Leu Asp
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 690 695 700
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 705 710 715 720

Gly Asp Gly Ala Met Thr Ala Glu Lys Phe Trp Asp Trp Leu Asn Thr
 725 730 735
 Lys Tyr Thr Pro Gly Ser Ser Glu Ala Val Glu Thr Gln Glu His Ile
 740 745 750
 Val Gln Tyr Cys Gln Ala Leu Ala Gln Leu Glu Met Val Tyr His Ser
 755 760 765
 Thr Gly Ile Asn Glu Asn Ala Phe Arg Leu Phe Val Thr Lys Pro Glu
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 Met Phe Gly Ala Ala Thr Gly Ala Ala Pro Ala His Asp Ala Leu Ser
 785 790 795 800
 Leu Ile Met Leu Thr Arg Phe Ala Asp Trp Val Asn Ala Leu Gly Glu
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 Lys Ala Ser Ser Val Leu Ala Ala Phe Glu Ala Asn Ser Leu Thr Ala
 820 825 830
 Glu Gln Leu Ala Asp Ala Met Asn Leu Asp Ala Asn Leu Leu Gln
 835 840 845
 Ala Ser Ile Gln Ala Gln Asn His Gln His Leu Pro Pro Val Thr Pro
 850 855 860
 Glu Asn Ala Phe Ser Cys Trp Thr Ser Ile Asn Thr Ile Leu Gln Trp
 865 870 875 880
 Val Asn Val Ala Gln Gln Leu Asn Val Ala Pro Gln Gly Val Ser Ala
 885 890 895
 Leu Val Gly Leu Asp Tyr Ile Gln Ser Met Lys Glu Thr Pro Thr Tyr
 900 905 910
 Ala Gln Trp Glu Asn Ala Ala Gly Val Leu Thr Ala Gly Leu Asn Ser
 915 920 925
 Gln Gln Ala Asn Thr Leu His Ala Phe Leu Asp Glu Ser Arg Ser Ala
 930 935 940
 Ala Leu Ser Thr Tyr Tyr Ile Arg Gln Val Ala Lys Ala Ala Ala
 945 950 955 960
 Ile Lys Ser Arg Asp Asp Leu Tyr Gln Tyr Leu Leu Ile Asp Asn Gln
 965 970 975
 Val Ser Ala Ala Ile Lys Thr Thr Arg Ile Ala Glu Ala Ile Ala Ser
 980 985 990
 Ile Gln Leu Tyr Val Asn Arg Ala Leu Glu Asn Val Glu Glu Asn Ala
 995 1000 1005
 Asn Ser Gly Val Ile Ser Arg Gln Phe Phe Ile Asp Trp Asp Lys
 1010 1015 1020
 Tyr Asn Lys Arg Tyr Ser Thr Trp Ala Gly Val Ser Gln Leu Val
 1025 1030 1035
 Tyr Tyr Pro Glu Asn Tyr Ile Asp Pro Thr Met Arg Ile Gly Gln
 1040 1045 1050
 Thr Lys Met Met Asp Ala Leu Leu Gln Ser Val Ser Gln Ser Gln

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Leu Asn Ala Asp Thr Val	Glu Asp Ala Phe Met	Ser Tyr Leu Thr
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Ser Phe Glu Gln Val Ala Asn	Leu Lys Val Ile Ser	Ala Tyr His
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Asp Asn Ile Asn Asn Asp	Gln Gly Leu Thr Tyr	Phe Ile Gly Leu
1100	1105	1110
Ser Glu Thr Asp Ala Gly	Glu Tyr Tyr Trp Arg	Ser Val Asp His
1115	1120	1125
Ser Lys Phe Asn Asp Gly	Lys Phe Ala Ala Asn	Ala Trp Ser Glu
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Trp His Lys Ile Asp Cys	Pro Ile Asn Pro Tyr	Lys Ser Thr Ile
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Arg Pro Val Ile Tyr Lys	Ser Arg Leu Tyr Leu	Leu Trp Leu Glu
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Gln Lys Glu Ile Thr Lys	Gln Thr Gly Asn Ser	Lys Asp Gly Tyr
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Gln Thr Glu Thr Asp Tyr	Arg 1195 Tyr Glu Leu Lys	Leu Ala His Ile
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Arg Tyr Asp Gly Thr Trp	Asn 1210 Thr Pro Ile Thr	Phe Asp Val Asn
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Lys Lys Ile Ser Glu Leu	Lys 1225 Leu Glu Lys Asn	Arg Ala Pro Gly
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Leu Tyr Cys Ala Gly Tyr	Gln 1240 Gly Glu Asp Thr	Leu Leu Val Met
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Phe Tyr Asn Gln Gln Asp	Thr 1255 Leu Asp Ser Tyr	Lys Asn Ala Ser
1250		1260
Met Gln Gly Leu Tyr Ile	Phe 1270 Ala Asp Met Ala	Ser Lys Asp Met
1265		1275
Thr Pro Glu Gln Ser Asn	Val 1285 Tyr Arg Asp Asn	Ser Tyr Gln Gln
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Phe Asp Thr Asn Asn Val	Arg 1300 Val Asn Asn	Arg Tyr Ala Glu
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Asp Tyr Glu Ile Pro Ser	Ser 1315 Val Ser Ser Arg	Lys Asp Tyr Gly
1310		1320
Trp Gly Asp Tyr Tyr Leu	Ser 1330 Met Val Tyr Asn	Gly Asp Ile Pro
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Thr Ile Asn Tyr Lys Ala	Ala 1345 Ser Ser Asp Leu	Lys Ile Tyr Ile
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Ser Pro Lys Leu Arg Ile	Ile 1360 His Asn Gly Tyr	Glu Gly Gln Lys
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Arg Asn Gln Cys Asn Leu	Met 1375 Asn Lys Tyr Gly	Lys Leu Gly Asp
1370		1380

Lys	Phe	Ile	Val	Tyr	Thr	Ser	Leu	Gly	Val	Asn	Pro	Asn	Asn	Ser
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Ser	Asn	Lys	Leu	Met	Phe	Tyr	Pro	Val	Tyr	Gln	Tyr	Ser	Gly	Asn
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Thr	Ser	Gly	Leu	Asn	Gln	Gly	Arg	Leu	Leu	Phe	His	Arg	Asp	Thr
1415						1420					1425			
Thr	Tyr	Pro	Ser	Lys	Val	Glu	Ala	Trp	Ile	Pro	Gly	Ala	Lys	Arg
1430						1435					1440			
Ser	Leu	Thr	Asn	Gln	Asn	Ala	Ala	Ile	Gly	Asp	Asp	Tyr	Ala	Thr
1445						1450					1455			
Asp	Ser	Leu	Asn	Lys	Pro	Asp	Asp	Leu	Lys	Gln	Tyr	Ile	Phe	Met
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Thr	Asp	Ser	Lys	Gly	Thr	Ala	Thr	Asp	Val	Ser	Gly	Pro	Val	Glu
1475						1480					1485			
Ile	Asn	Thr	Ala	Ile	Ser	Pro	Ala	Lys	Val	Gln	Ile	Ile	Val	Lys
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Ile	Gln	Pro	Ser	Pro	Ser	Phe	Asp	Glu	Met	Asn	Tyr	Gln	Phe	Asn
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Ser	Thr	Asp	Asn	Ala	Leu	Thr	Leu	His	His	Asn	Glu	Asn	Gly	Ala
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Gln	Tyr	Met	Gln	Trp	Gln	Ser	Tyr	Arg	Thr	Arg	Leu	Asn	Thr	Leu
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Phe	Ala	Arg	Gln	Leu	Val	Ala	Arg	Ala	Thr	Thr	Gly	Ile	Asp	Thr
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Val	Asp	Asn	Asn	Ser	His	Ile	Ile	Tyr	Ser	Gly	Gln	Leu	Thr	Asp
1670						1675					1680			
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Leu Asn Gln Asp Tyr His Ala Lys Val Tyr Met Thr Phe Lys Lys
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Ser Pro Ser Asp Gly Thr Trp Trp Gly Pro His Phe Val Arg Asp
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Asp Lys Gly Ile Val Thr Ile Asn Pro Lys Ser Ile Leu Thr His
 1730 1735 1740

Phe Glu Ser Val Asn Val Leu Asn Asn Ile Ser Ser Glu Pro Met
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Asp Phe Ser Gly Ala Asn Ser Leu Tyr Phe Trp Glu Leu Phe Tyr
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Tyr Thr Pro Met Leu Val Ala Gln Arg Leu Leu His Glu Gln Asn
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Phe Asp Glu Ala Asn Arg Trp Leu Lys Tyr Val Trp Ser Pro Ser
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Gly Tyr Ile Val His Gly Gln Ile Gln Asn Tyr Gln Trp Asn Val
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Arg Pro Leu Leu Glu Asp Thr Ser Trp Asn Ser Asp Pro Leu Asp
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Ser Val Asp Pro Asp Ala Val Ala Gln His Asp Pro Met His Tyr
 1835 1840 1845

Lys Val Ser Thr Phe Met Arg Thr Leu Asp Leu Leu Ile Ala Arg
 1850 1855 1860

Gly Asp His Ala Tyr Arg Gln Leu Glu Arg Asp Thr Leu Asn Glu
 1865 1870 1875

Ala Lys Met Trp Tyr Met Gln Ala Leu His Leu Leu Gly Asp Lys
 1880 1885 1890

Pro Tyr Leu Pro Leu Ser Thr Thr Trp Ser Asp Pro Arg Leu Asp
 1895 1900 1905

Arg Ala Ala Asp Ile Thr Thr Gln Asn Ala His Asp Ser Ala Ile
 1910 1915 1920

Val Ala Leu Arg Gln Asn Ile Pro Thr Pro Ala Pro Leu Ser Leu
 1925 1930 1935

Arg Ser Ala Asn Thr Leu Thr Asp Leu Phe Leu Pro Gln Ile Asn
 1940 1945 1950

Glu Val Met Met Asn Tyr Trp Gln Thr Leu Ala Gln Arg Val Tyr
 1955 1960 1965

Asn Leu Arg His Asn Leu Ser Ile Asp Gly Gln Pro Leu Tyr Leu
 1970 1975 1980

Pro Ile Tyr Ala Thr Pro Ala Asp Pro Lys Ala Leu Leu Ser Ala
 1985 1990 1995

Ala Val Ala Thr Ser Gln Gly Gly Gly Lys Leu Pro Glu Ser Phe
 2000 2005 2010

Met Ser Leu Trp Arg Phe Pro His Met Leu Glu Asn Ala Arg Gly

2015	2020	2025
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2030 2035	2035	2040
Ile Glu Arg Gln Asp Ala	Glu Ala Leu Asn Ala	Leu Leu Gln Asn
2045	2050	2055
Gln Ala Ala Glu Leu Ile	Leu Thr Asn Leu Ser	Ile Gln Asp Lys
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Thr Ile Glu Glu Leu Asp Ala	Glu Lys Thr Val	Leu Glu Lys Ser
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Lys Ala Gly Ala Gln Ser Arg	Phe Asp Ser Tyr	Gly Lys Leu Tyr
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Asp Glu Asn Ile Asn Ala	Gly Glu Asn Gln Ala	Met Thr Leu Arg
2105	2110	2115
Ala Ser Ala Ala Gly Leu	Thr Ala Val Gln Ala	Ser Arg Leu
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Ala Gly Ala Ala Ala Asp	Leu Val Pro Asn Ile	Phe Gly Phe Ala
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Gly Gly Ser Arg Trp	Gly Ala Ile Ala Glu Ala	Thr Gly Tyr
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Val Met Glu Phe Ser Ala Asn	Val Met Asn Thr	Glu Ala Asp Lys
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Ile Ser Gln Ser Glu Thr Tyr	Arg Arg Arg Arg	Gln Glu Trp Glu
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Ile Gln Arg Asn Asn Ala	Glu Ala Glu Leu Lys	Gln Ile Asp Ala
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Gln Leu Lys Ser Leu Ala Val	Arg Arg Glu Ala	Ala Val Leu Gln
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Lys Thr Ser Leu Lys Thr	Gln Glu Gln Thr	Gln Ser Gln Leu
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Ala Phe Leu Gln Arg Lys	Phe Ser Asn Gln Ala	Leu Tyr Asn Trp
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Leu Arg Gly Arg Leu Ala Ala	Ile Tyr Phe Gln	Phe Tyr Asp Leu
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Ala Val Ala Arg Cys Leu Met	Ala Glu Gln Ala	Tyr Arg Trp Glu
2270	2275	2280
Leu Asn Asp Asp Ser Ala Arg	Phe Ile Lys Pro	Gly Ala Trp Gln
2285	2290	2295
Gly Thr Tyr Ala Gly Leu	Leu Ala Gly Glu Thr	Leu Met Leu Ser
2300	2305	2310
Leu Ala Gln Met Glu Asp Ala	His Leu Lys Arg	Asp Lys Arg Ala
2315	2320	2325
Leu Glu Val Glu Arg Thr Val	Ser Leu Ala Glu	Val Tyr Ala Gly
2330	2335	2340

Leu	Pro	Lys	Asp	Asn	Gly	Pro	Phe	Ser	Leu	Ala	Gln	Glu	Ile	Asp		
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Lys	Leu	Val	Ser	Gln	Gly	Ser	Gly	Ser	Ala	Gly	Ser	Gly	Asn	Asn		
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Asn	Leu	Ala	Phe	Gly	Ala	Gly	Thr	Asp	Thr	Lys	Thr	Ser	Leu	Gln		
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Ala	Ser	Val	Ser	Phe	Ala	Asp	Leu	Lys	Ile	Arg	Glu	Asp	Tyr	Pro		
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Ala	Ser	Leu	Gly	Lys	Ile	Arg	Arg	Ile	Lys	Gln	Ile	Ser	Val	Thr		
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Leu	Pro	Ala	Leu	Leu	Gly	Pro	Tyr	Gln	Asp	Val	Gln	Ala	Ile	Leu		
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Ser	Tyr	Gly	Asp	Lys	Ala	Gly	Leu	Ala	Asn	Gly	Cys	Glu	Ala	Leu		
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Ala	Val	Ser	His	Gly	Met	Asn	Asp	Ser	Gly	Gln	Phe	Gln	Leu	Asp		
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Phe	Asn	Asp	Gly	Lys	Phe	Leu	Pro	Phe	Glu	Gly	Ile	Ala	Ile	Asp		
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Gln	Gly	Thr	Leu	Thr	Leu	Ser	Phe	Pro	Asn	Ala	Ser	Met	Pro	Glu		
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Lys	Gly	Lys	Gln	Ala	Thr	Met	Leu	Lys	Thr	Leu	Asn	Asp	Ile	Ile		
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Met	Asn	Thr	Leu	Lys	Ser	Glu	Tyr	Gln	Gln	Ala	Leu	Gly	Ala	Gly	Phe	
1						5				10				15		
& aat aat cta acc gat atc tgc cat ctc tct ttt gac gaa ctg cgc aaa																
Asn	Asn	Leu	Thr	Asp	Ile	Cys	His	Leu	Ser	Phe	Asp	Glu	Leu	Arg	Lys	96
20						25							30			
& aaa gtg aag gat aaa ctc tca tgg tca cag acc cag agc tta tat ctt																
Lys	Val	Lys	Asp	Lys	Leu	Ser	Trp	Ser	Gln	Thr	Gln	Ser	Leu	Tyr	Leu	144
35						40							45			

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Glu Ala Gln Gln Val Gln Lys Asp Asn Leu Leu His Glu Ala Arg Ile	
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ctg aaa cgc gca aac cct cat tta caa agt gcg gtc cat ctt gcc ctg	240
Leu Lys Arg Ala Asn Pro His Leu Gln Ser Ala Val His Leu Ala Leu	
65 70 75 80	
aca gca cct cat gca gac cag caa ggt tat aat agc cga ttt ggc aat	288
Thr Ala Pro His Ala Asp Gln Gln Gly Tyr Asn Ser Arg Phe Gly Asn	
85 90 95	
cgc gcc agc aaa tat gca gcc cct ggc gca att tcc tcc atg ttt tct	336
Arg Ala Ser Lys Tyr Ala Ala Pro Gly Ala Ile Ser Ser Met Phe Ser	
100 105 110	
ctt gcg gct tat ctg act gaa ctt tat cgt cag gca cga aat tta cat	384
Leu Ala Ala Tyr Leu Thr Glu Leu Tyr Arg Gln Ala Arg Asn Leu His	
115 120 125	
gca gaa ggt tcc att tat cat ctg gat acg cgt cgc cca gat cta aaa	432
Ala Glu Gly Ser Ile Tyr His Leu Asp Thr Arg Arg Pro Asp Leu Lys	
130 135 140	
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Ser Leu Val Leu Ser Gln Lys Asn Met Asn Thr Glu Ile Ser Thr Leu	
145 150 155 160	
tct ctg tct aat aac atg ttg cta aac agt att aag act cag cct aat	528
Ser Leu Ser Asn Asn Met Leu Leu Asn Ser Ile Lys Thr Gln Pro Asn	
165 170 175	
ctg aac agc cac gct aaa gtg atg gaa aag tta tca act ttc cgc act	576
Leu Asn Ser His Ala Lys Val Met Glu Lys Leu Ser Thr Phe Arg Thr	
180 185 190	
tct ggc tca atg cca tat cac gat gct tat gaa agt gta cgt aag att	624
Ser Gly Ser Met Pro Tyr His Asp Ala Tyr Glu Ser Val Arg Lys Ile	
195 200 205	
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Ile Gln Leu Gln Ala Pro Val Phe Glu Gln Ser Ser Thr Leu Thr Asp	
210 215 220	
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Thr Pro Ile Thr Lys Leu Met Tyr Gln Ile Ser Leu Leu Gly Ile Asn	
225 230 235 240	
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Ala Ser Val Ser Pro Glu Leu Phe Thr Ile Leu Thr Gln Lys Ile Lys	
245 250 255	
cca gca acc aat gct gat aac act aat gaa cta aaa aaa ctt tat aag	816
Pro Ala Thr Asn Ala Asp Asn Thr Asn Glu Leu Lys Lys Leu Tyr Lys	
260 265 270	
aag aat ttt ggt gaa att aaa tct att caa atg gca agg gca gaa tac	864
Lys Asn Phe Gly Glu Ile Lys Ser Ile Gln Met Ala Arg Ala Glu Tyr	
275 280 285	
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Leu Lys Ser Tyr Tyr Asn Leu Thr Asp Lys Glu Leu Asn Gln Phe Ser	
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Thr Gln Tyr His Leu Leu Lys Phe Asn Lys Ala Ile Asn Leu Ser Arg	
325 330 335	
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Ser Thr Glu Leu Ser Pro Ile Ile Leu Asn Ser Ile Ala Ile Asp Ile	
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Asp Pro Asp Tyr Leu Glu Ser Phe Gln Asp Leu Asp Leu Ser Asp Glu	
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Pro Asp Ile Asp Glu Asp Val Leu Arg Glu Ala Leu Arg Val Lys Asp	
385 390 395 400	
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Tyr Met Gln Arg Tyr Gly Ile Asp Ala Glu Thr Ala Leu Ile Leu Cys	
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Lys Ala Pro Ile Ser Glu Asn Pro Ser His Pro Asp Leu Ser Lys Leu	
420 425 430	
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Leu Ala Asp Ile His Gln Leu Thr Ile Asp Glu Leu Gly Val Leu Leu	
435 440 445	
gtt gcc ata gat gaa gga aaa acc gat tta tct cag att act cat gac	1392
Val Ala Ile Asp Glu Gly Lys Thr Asp Leu Ser Gln Ile Thr His Asp	
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Asn Leu Ala Val Leu Ile Ser Lys Leu Tyr Ser Val Thr Asn Trp Leu	
465 470 475 480	
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Lys Tyr Asn Lys Thr Leu Thr Pro Glu Ile Asn Asn Leu Leu Asp Thr	
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Val Tyr Asn Gly Leu Gln Asn Phe Tyr Lys Asp Asn Leu Leu Lys Ile	
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gca gat aaa cta aac tct ggc aaa gaa aac aaa atg acg gca gat tca Ala Asp Lys Leu Asn Ser Gly Lys Glu Asn Lys Met Thr Ala Asp Ser 660 665 670	2016
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gta ctg acc gag ttt gaa aaa gga aca tta acg gca gaa cta ttg gct Val Leu Thr Glu Phe Glu Lys Gly Thr Leu Thr Ala Glu Leu Leu Ala 785 790 795 800	2400
aac gcc atg aat ctt gat aaa aat cta cta gag caa gcc agt act caa Asn Ala Met Asn Leu Asp Lys Asn Leu Leu Glu Gln Ala Ser Thr Gln 805 810 815	2448

gca caa gct gat ttc tcc aat tgg cca tct atc gac aac cta ttg cag Ala Gln Ala Asp Phe Ser Asn Trp Pro Ser Ile Asp Asn Leu Leu Gln 820 825 830	2496
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gcc aat acc cta cat gca ttt ctg ggt gag tct cgc agt act gcg tta Ala Asn Thr Leu His Ala Phe Leu Gly Glu Ser Arg Ser Thr Ala Leu 885 890 895	2688
agt aca tac tat att tat tct cat aac caa aaa gat cga gaa gaa aga Ser Thr Tyr Tyr Ile Tyr Ser His Asn Gln Lys Asp Arg Glu Glu Arg 900 905 910	2736
aaa cat acg gta att aaa gac cgt gat gat cta tat caa tac ctg ttg Lys His Thr Val Ile Lys Asp Arg Asp Asp Leu Tyr Gln Tyr Leu Leu 915 . 920 925	2784
atc gat aac caa gtc tcc gcc gcc atc aaa acc acg gag att gct gaa Ile Asp Asn Gln Val Ser Ala Ala Ile Lys Thr Thr Glu Ile Ala Glu 930 935 940	2832
gct atc gct agt atc caa ctg tat att aac cgc gca ttg aaa aat atg Ala Ile Ala Ser Ile Gln Leu Tyr Ile Asn Arg Ala Leu Lys Asn Met 945 950 955 960	2880
gag gga gat acc gac aca agt gtc act agc cgt tta ttc ttc act aac Glu Gly Asp Thr Asp Thr Ser Val Thr Ser Arg Leu Phe Phe Thr Asn 965 970 975	2928
tgg gat aaa tac aac aaa cgc tac agc acc tgg gct ggt att act aag Trp Asp Lys Tyr Asn Lys Arg Tyr Ser Thr Trp Ala Gly Ile Thr Lys 980 985 990	2976
ctc ctt tac tac cct gaa aac tat atc gat ccg aca ctg cgg atc ggc Leu Leu Tyr Pro Glu Asn Tyr Ile Asp Pro Thr Leu Arg Ile Gly 995 1000 1005	3024
cag aca aaa atg atg gat acg cta ctg caa tcc atc agc caa agt Gln Thr Lys Met Met Asp Thr Leu Leu Gln Ser Ile Ser Gln Ser 1010 1015 1020	3069
caa ttg aat acc gat acc gta gaa gat gcc ttt aaa tct tat cta Gln Leu Asn Thr Asp Thr Val Glu Asp Ala Phe Lys Ser Tyr Leu 1025 1030 1035	3114
acg tca ttc gaa caa gtg gct aat ctg gaa gtc atc agc gcc tat Thr Ser Phe Glu Gln Val Ala Asn Leu Glu Val Ile Ser Ala Tyr 1040 1045 1050	3159
cat gac aat att aat aat gac caa gga ttg acc tat ttt atc gga His Asp Asn Ile Asn Asn Asp Gln Gly Leu Thr Tyr Phe Ile Gly 1055 1060 1065	3204

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Arg	Ser	Lys	Thr	Glu	Val	Asn	Gln	Tyr	Tyr	Trp	Arg	Ser	Val	Asp	
1070					1075						1080				
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His	Asn	Lys	Phe	Ser	Glu	Gly	Lys	Phe	Pro	Ala	Asn	Ala	Trp	Ser	
1085					1090						1095				
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Glu	Trp	His	Lys	Ile	Asp	Cys	Pro	Ile	Asn	Pro	Tyr	Glu	Asp	Thr	
1100						1105						1110			
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Ile	Arg	Pro	Val	Val	Tyr	Gln	Ser	Arg	Leu	Tyr	Ile	Ile	Trp	Leu	
1115						1120						1125			
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Glu	Gln	Lys	Lys	Val	Thr	Asn	Arg	Ala	Glu	Gly	Glu	Ala	Ile	Lys	
1130						1135						1140			
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Gln	Gly	Ser	Lys	Thr	Thr	Thr	Ser	Tyr	His	Tyr	Glu	Leu	Lys	Leu	
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Ala	His	Ile	Arg	Tyr	Asp	Gly	Thr	Trp	Asn	Thr	Pro	Ile	Thr	Phe	
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Asp	Val	Asp	Glu	Lys	Ile	Ser	Gly	Leu	Asn	Leu	Glu	Leu	Asn	Lys	
1175						1180						1185			
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Ala	Leu	Gly	Leu	Tyr	Cys	Ala	Ser	Tyr	Gln	Gly	Lys	Asp	Lys	Leu	
1190						1195						1200			
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Leu	Val	Met	Phe	Tyr	Lys	Lys	Gln	Glu	Gln	Leu	Asn	Asn	Tyr	Thr	
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1220						1225						1230			
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Ile	Thr	Ser	Asn	Met	Ser	Pro	Glu	Glu	Met	Thr	Pro	Glu	Ser	Tyr	
1235						1240						1245			
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Arg	Leu	Asn	Ala	His	Lys	Gln	Phe	Asp	Thr	Asn	Asn	Val	Val	Arg	
1250						1255						1260			
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Val	Asn	Asn	Arg	Tyr	Ala	Glu	Ser	Tyr	Glu	Ile	Pro	Ser	Ser	Val	
1265						1270						1275			
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Asn	Ser	Asn	Asn	Gly	Tyr	Asp	Trp	Gly	Glu	Gly	Tyr	Leu	Ser	Met	
1280						1285						1290			
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Val	Tyr	Gly	Gly	Ser	Ile	Leu	Ile	Thr	Arg	Asp	Pro	Ser	Asp	Asn	
1295						1300						1305			

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Ser	Lys	Ile	Gln	Ile	Ser	Pro	Lys	Leu	Arg	Ile	Ile	His	Asn	Gly	
1310						1315					1320				
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Tyr	Glu	Gly	Arg	Gln	Arg	Asn	Gln	Cys	Asn	Leu	Met	Lys	Lys	Tyr	
1325						1330					1335				
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Gly	Lys	Leu	Gly	Asp	Lys	Phe	Ile	Ile	Tyr	Thr	Thr	Leu	Gly	Ile	
1340						1345					1350				
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Asn	Pro	Asn	Asn	Leu	Ser	Asn	Lys	Lys	Leu	Ile	Tyr	Pro	Val	Tyr	
1355						1360					1365				
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Gln	Tyr	Glu	Gly	Asn	Glu	Ser	Lys	Leu	Ser	Gln	Gly	Arg	Leu	Leu	
1370						1375					1380				
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Phe	Tyr	Arg	Asp	Ser	Thr	Thr	Asn	Phe	Thr	Arg	Ala	Trp	Phe	Pro	
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Asn	Ile	Ser	Gly	Asn	Tyr	Gly	Tyr	Ile	Asp	Asn	Lys	His	Ser	Asp	
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Asn	Lys	Pro	Phe	Glu	Glu	Tyr	Phe	Tyr	Met	Asp	Asp	His	Gly	Gly	
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Ile	Asp	Thr	Asp	Val	Ser	Glu	Pro	Ile	Phe	Ile	Asn	Thr	Lys	Ile	
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Gln	Pro	Ser	Asn	Val	Lys	Ile	Ile	Val	Lys	Thr	Val	Lys	Asp	Asp	
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Gly	Lys	Leu	Asp	Ser	Lys	Pro	Tyr	Ile	Ala	Glu	Asp	Lys	Val	Ser	
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Asn	Leu	Asp	Gln	Ile	Asp	Val	Ser	Thr	Leu	Val	Phe	Lys	Asn	Asn	
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Glu	Ala	Ser	Ile	Asp	Ile	Thr	Phe	Thr	Ala	Ser	Ala	Asp	Ala	Phe	
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Glu	Ser	Gly	Lys	Glu	Gln	Arg	Asn	Leu	Gly	Glu	Glu	His	Phe	Ser	
1535						1540					1545				

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Ile	Arg	Ile	Ile	Lys	Lys	Ala	Asn	Val	Asn	Asp	Val	Leu	Thr	Leu	
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His	His	Asp	Pro	Ser	Gly	Ala	Gln	Tyr	Met	Gln	Trp	Gly	Ala	Tyr	
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Arg	Thr	Arg	Leu	Asn	Thr	Leu	Phe	Ala	Arg	Lys	Leu	Ile	Ser	Arg	
1580						1585						1590			
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Ala	Asn	Ala	Gly	Ile	Asp	Thr	Ile	Leu	Ser	Met	Glu	Thr	Gln	Asn	
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Ile	Gln	Glu	Pro	Gln	Leu	Gly	Lys	Gly	Phe	Tyr	Val	Asn	Phe	Thr	
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Lys	Ile	His	Ile	Gly	Asn	Ile	Ala	Gly	Asp	Asn	Thr	Met	Arg	Pro	
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Pro	Ala	Phe	Phe	Tyr	Phe	Asn	Glu	Ile	Gln	Gln	Lys	Phe	Ile	Leu	
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Ile	Asn	Asp	Ala	Asp	His	Asn	Ser	Ala	Met	Thr	Gln	Ser	Gly	Glu	
1715						1720						1725			
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Lys	Thr	Gly	Ile	Lys	Lys	Tyr	Lys	Gly	Phe	Leu	Asp	Val	Ser	Ile	
1730						1735						1740			
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Leu	Ile	Asp	His	Gln	His	Thr	Glu	Pro	Met	Asp	Phe	Asn	Gly	Ala	
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1760						1765						1770			
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Ile	Ala	Gln	Arg	Leu	Leu	His	Glu	Gln	Asn	Phe	Asp	Glu	Ala	Asn	
1775						1780						1785			

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Gly	Gln	Lys	Gln	His	Pro	His	Asn	Trp	Asn	Val	Arg	Pro	Leu	Gln	
1805						1810					1815				
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Glu	Asp	Thr	Ser	Trp	Asn	Asp	Asp	Pro	Leu	Asp	Thr	Phe	Asp	Pro	
1820						1825					1830				
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Asp	Ala	Ile	Ala	Gln	His	Asp	Pro	Met	His	Tyr	Lys	Val	Ala	Thr	
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Phe	Met	Cys	Ala	Leu	Asp	Leu	Leu	Ile	Glu	Gln	Gly	Asp	Tyr	Ala	
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Tyr	Arg	Gln	Leu	Glu	Arg	Asp	Thr	Leu	Ala	Glu	Ala	Lys	Met	Trp	
1865						1870					1875				
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Tyr	Met	Gln	Ala	Leu	His	Leu	Leu	Gly	Asp	Lys	Pro	His	Leu	Leu	
1880						1885					1890				
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Leu	Ser	Ser	Thr	Trp	Ser	Asp	Pro	Glu	Leu	Lys	Glu	Ala	Ala	Asp	
1895						1900					1905				
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Leu	Glu	Lys	Gln	Gln	Ala	His	Ala	Lys	Ala	Ile	Ala	Asp	Leu	Arg	
1910						1915					1920				
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Gln	Gly	Gln	Pro	Lys	Asp	Gly	Ser	Asn	Thr	Asp	Leu	Phe	Leu	Pro	
1925						1930					1935				
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Gln	Val	Asn	Glu	Val	Met	Leu	Ser	Tyr	Trp	Gln	Lys	Leu	Glu	Gln	
1940						1945					1950				
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Arg	Leu	Tyr	Asn	Leu	Arg	His	Asn	Leu	Ser	Ile	Asp	Gly	Gln	Pro	
1955						1960					1965				
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Leu	His	Leu	Pro	Ile	Phe	Ala	Thr	Pro	Ala	Asp	Pro	Lys	Ala	Leu	
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Leu	Ser	Ala	Ala	Val	Ala	Ser	Ser	Gln	Gly	Gly	Ser	Asn	Leu	Pro	
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Ser	Glu	Phe	Ile	Ser	Val	Trp	Arg	Phe	Pro	His	Met	Leu	Glu	Asn	
2000						2005					2010				
gcc	cgc	agt	atg	gtc	agt	caa	ctc	acc	caa	ttc	ggc	tcc	aca	tta	6084
Ala	Arg	Ser	Met	Val	Ser	Gln	Leu	Thr	Gln	Phe	Gly	Ser	Thr	Leu	
2015						2020					2025				

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Gln	Asn	Ile	Ile	Glu	Arg	Gln	Asp	Ala	Glu	Ala	Leu	Asn	Thr	Leu	
2030						2035					2040				
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Leu	Gln	Asn	Gln	Ala	Ala	Glu	Leu	Ile	Leu	Thr	Asn	Leu	Ser	Ile	
2045						2050					2055				
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Gln	Asp	Lys	Thr	Ile	Glu	Glu	Leu	Asp	Val	Glu	Lys	Thr	Val	Leu	
2060						2065					2070				
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Glu	Lys	Thr	Arg	Ala	Gly	Ala	Lys	Ser	Arg	Phe	Asp	Ser	Tyr	Ser	
2075						2080					2085				
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Lys	Phe	Tyr	Asp	Glu	Asp	Ile	Asn	Ala	Gly	Glu	Lys	Gln	Ala	Met	
2090						2095					2100				
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Ala	Leu	Arg	Ala	Ser	Val	Ala	Gly	Ile	Ser	Thr	Ala	Leu	Gln	Ala	
2105						2110					2115				
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Ser	His	Leu	Ala	Gly	Ala	Ala	Leu	Asp	Leu	Ala	Pro	Asn	Ile	Phe	
2120						2125					2130				
ggc	tcc	gct	gat	ggc	ggt	agc	cat	tgg	gga	gca	att	gcc	caa	gcc	6444
Gly	Phe	Ala	Asp	Gly	Gly	Ser	His	Trp	Gly	Ala	Ile	Ala	Gln	Ala	
2135						2140					2145				
aca	agt	aat	gtc	atg	gaa	tcc	tcc	gcc	agt	gtc	atg	agc	acc	gaa	6489
Thr	Ser	Asn	Val	Met	Glu	Phe	Ser	Ala	Ser	Val	Met	Ser	Thr	Glu	
2150						2155					2160				
gcg	gat	aaa	atc	agc	cag	tct	gaa	gcc	tac	cgt	cgg	cgt	cga	cag	6534
Ala	Asp	Lys	Ile	Ser	Gln	Ser	Glu	Ala	Tyr	Arg	Arg	Arg	Arg	Gln	
2165						2170					2175				
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Glu	Trp	Lys	Ile	Gln	Arg	Asn	Asn	Ala	Asp	Ala	Glu	Leu	Lys	Gln	
2180						2185					2190				
atc	gat	gct	caa	ctt	caa	tca	tta	gtc	gta	cgc	cgt	gaa	gcc	gcc	6624
Ile	Asp	Ala	Gln	Leu	Gln	Ser	Leu	Val	Val	Arg	Arg	Glu	Ala	Ala	
2195						2200					2205				
gtg	ttg	cag	aaa	acc	agc	ctg	aaa	acc	caa	caa	gag	cag	acg	cac	6669
Val	Leu	Gln	Lys	Thr	Ser	Leu	Lys	Thr	Gln	Gln	Glu	Gln	Thr	His	
2210						2215					2220				
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Ala	Gln	Leu	Thr	Phe	Leu	Gln	His	Lys	Phe	Ser	Asn	Gln	Ala	Leu	
2225						2230					2235				
tac	aac	tgg	ctg	cgt	ggt	cg	ctg	tcc	gcc	att	tac	ttc	cag	ttc	6759
Tyr	Asn	Trp	Leu	Arg	Gly	Arg	Leu	Ser	Ala	Ile	Tyr	Phe	Gln	Phe	
2240						2245					2250				
tat	gat	tta	gcg	gta	gcc	cgt	tgc	ctg	atg	gct	gaa	atg	gcc	tat	6804
Tyr	Asp	Leu	Ala	Val	Ala	Arg	Cys	Leu	Met	Ala	Glu	Met	Ala	Tyr	
2255						2260					2265				

cgt	tgg	gag	act	aac	gat	gcc	gca	gca	cgc	ttt	atc	aag	ccc	ggc	6849
Arg	Trp	Glu	Thr	Asn	Asp	Ala	Ala	Ala	Arg	Phe	Ile	Lys	Pro	Gly	
2270						2275					2280				
gcc	tgg	cag	gga	acc	cat	gcc	ggt	ctg	ctg	gct	ggt	gaa	acc	tta	6894
Ala	Trp	Gln	Gly	Thr	His	Ala	Gly	Leu	Leu	Ala	Gly	Glu	Thr	Leu	
2285						2290					2295				
atg	ctg	aat	cta	gca	cag	atg	gaa	gat	gcc	cac	ctg	aaa	cag	gag	6939
Met	Leu	Asn	Leu	Ala	Gln	Met	Glu	Asp	Ala	His	Leu	Lys	Gln	Glu	
2300						2305					2310				
caa	cgc	gta	ctg	gag	gta	gaa	cgt	acc	gtt	tca	cta	gca	gaa	gtt	6984
Gln	Arg	Val	Leu	Glu	Val	Glu	Arg	Thr	Val	Ser	Leu	Ala	Glu	Val	
2315						2320					2325				
tat	aaa	gag	aaa	ggt	caa	ttt	tct	ctg	acc	aag	aaa	att	gca	gaa	7029
Tyr	Lys	Glu	Lys	Gly	Gln	Phe	Ser	Leu	Thr	Lys	Lys	Ile	Ala	Glu	
2330						2335					2340				
ctg	gtg	aat	aag	aaa	cca	gac	act	acc	agt	agc	aga	aat	aac	aca	7074
Leu	Val	Asn	Lys	Lys	Pro	Asp	Thr	Thr	Ser	Ser	Arg	Asn	Asn	Thr	
2345						2350					2355				
ctg	aat	ttt	ggt	gaa	gga	aat	gcc	aaa	act	tct	cta	caa	gcg	tct	7119
Leu	Asn	Phe	Gly	Glu	Gly	Asn	Ala	Lys	Thr	Ser	Leu	Gln	Ala	Ser	
2360						2365					2370				
att	tcg	tta	gct	gac	tta	caa	att	cgt	cac	gat	tac	cca	gaa	aac	7164
Ile	Ser	Leu	Ala	Asp	Leu	Gln	Ile	Arg	His	Asp	Tyr	Pro	Glu	Asn	
2375						2380					2385				
agt	gga	gcc	ggt	aac	gtc	cgc	cgg	att	aaa	cag	atc	agt	gtc	acc	7209
Ser	Gly	Ala	Gly	Asn	Val	Arg	Arg	Ile	Lys	Gln	Ile	Ser	Val	Thr	
2390						2395					2400				
ctg	ccg	gca	ctg	tta	gga	cct	tat	cag	gat	gtg	caa	gcg	att	ctg	7254
Leu	Pro	Ala	Leu	Leu	Gly	Pro	Tyr	Gln	Asp	Val	Gln	Ala	Ile	Leu	
2405						2410					2415				
tct	tat	ggc	gga	gat	gcc	acc	ggg	tta	gcc	aaa	ggt	tgt	aaa	gcg	7299
Ser	Tyr	Gly	Gly	Asp	Ala	Thr	Gly	Leu	Ala	Lys	Gly	Cys	Lys	Ala	
2420						2425					2430				
ctg	gca	gtt	tct	cac	gga	atg	aat	gac	agc	ggt	cag	ttc	caa	ttg	7344
Leu	Ala	Val	Ser	His	Gly	Met	Asn	Asp	Ser	Gly	Gln	Phe	Gln	Leu	
2435						2440					2445				
gat	ttc	aac	gat	ggc	aaa	ttc	ctg	cca	ttt	gaa	gga	atc	gaa	atc	7389
Asp	Phe	Asn	Asp	Gly	Lys	Phe	Leu	Pro	Phe	Glu	Gly	Ile	Glu	Ile	
2450						2455					2460				
gat	aaa	ggt	acg	ctg	aca	tta	agc	ttc	ccg	aat	gca	acc	gaa	aaa	7434
Asp	Lys	Gly	Thr	Leu	Thr	Leu	Ser	Phe	Pro	Asn	Ala	Thr	Glu	Lys	
2465						2470					2475				
caa	aaa	acc	atg	ctg	gag	agt	cta	agc	gac	atc	att	ctg	cat	att	7479
Gln	Lys	Thr	Met	Leu	Glu	Ser	Leu	Ser	Asp	Ile	Ile	Leu	His	Ile	
2480						2485					2490				
cgc	tac	acc	att	cgc	caa	taa									7500
Arg	Tyr	Thr	Ile	Arg	Gln										
2495															

<210> 4

<211> 2499

<212> PRT

<213> *Photorhabdus luminescens*

<400> 4

Met	Asn	Thr	Leu	Lys	Ser	Glu	Tyr	Gln	Gln	Ala	Leu	Gly	Ala	Gly	Phe
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Asn	Asn	Leu	Thr	Asp	Ile	Cys	His	Leu	Ser	Phe	Asp	Glu	Leu	Arg	Lys
				20				25					30		

Lys	Val	Lys	Asp	Lys	Leu	Ser	Trp	Ser	Gln	Thr	Gln	Ser	Leu	Tyr	Leu
				35			40				45				

Glu	Ala	Gln	Gln	Val	Gln	Lys	Asp	Asn	Leu	Leu	His	Glu	Ala	Arg	Ile
				50		55				60					

Leu	Lys	Arg	Ala	Asn	Pro	His	Leu	Gln	Ser	Ala	Val	His	Leu	Ala	Leu
65					70				75			80			

Thr	Ala	Pro	His	Ala	Asp	Gln	Gln	Gly	Tyr	Asn	Ser	Arg	Phe	Gly	Asn
					85			90				95			

Arg	Ala	Ser	Lys	Tyr	Ala	Ala	Pro	Gly	Ala	Ile	Ser	Ser	Met	Phe	Ser
					100		105					110			

Leu	Ala	Ala	Tyr	Leu	Thr	Glu	Leu	Tyr	Arg	Gln	Ala	Arg	Asn	Leu	His
					115		120				125				

Ala	Glu	Gly	Ser	Ile	Tyr	His	Leu	Asp	Thr	Arg	Arg	Pro	Asp	Leu	Lys
				130			135			140					

Ser	Leu	Val	Leu	Ser	Gln	Lys	Asn	Met	Asn	Thr	Glu	Ile	Ser	Thr	Leu
145					150			155				160			

Ser	Leu	Ser	Asn	Asn	Met	Leu	Leu	Asn	Ser	Ile	Lys	Thr	Gln	Pro	Asn
					165			170				175			

Leu	Asn	Ser	His	Ala	Lys	Val	Met	Glu	Lys	Leu	Ser	Thr	Phe	Arg	Thr
					180		185				190				

Ser	Gly	Ser	Met	Pro	Tyr	His	Asp	Ala	Tyr	Glu	Ser	Val	Arg	Lys	Ile
			195				200				205				

Ile	Gln	Leu	Gln	Ala	Pro	Val	Phe	Glu	Gln	Ser	Ser	Thr	Leu	Thr	Asp
					210		215				220				

Thr	Pro	Ile	Thr	Lys	Leu	Met	Tyr	Gln	Ile	Ser	Leu	Leu	Gly	Ile	Asn
225					230				235				240		

Ala	Ser	Val	Ser	Pro	Glu	Leu	Phe	Thr	Ile	Leu	Thr	Gln	Lys	Ile	Lys
					245			250			255				

Pro	Ala	Thr	Asn	Ala	Asp	Asn	Thr	Asn	Glu	Leu	Lys	Lys	Leu	Tyr	Lys
					260			265			270				

Lys	Asn	Phe	Gly	Glu	Ile	Lys	Ser	Ile	Gln	Met	Ala	Arg	Ala	Glu	Tyr
					275			280			285				

Leu Lys Ser Tyr Tyr Asn Leu Thr Asp Lys Glu Leu Asn Gln Phe Ser
 290 295 300
 Lys Lys Ile Lys Gln Ile Asp Ser Leu Trp Asn Ile Gly Asp Glu Ile
 305 310 315 320
 Thr Gln Tyr His Leu Leu Lys Phe Asn Lys Ala Ile Asn Leu Ser Arg
 325 330 335
 Ser Thr Glu Leu Ser Pro Ile Ile Leu Asn Ser Ile Ala Ile Asp Ile
 340 345 350
 Leu Lys Lys Thr Pro Pro Glu Asp Asp Ser Asp Asn Pro Phe Arg Asp
 355 360 365
 Asp Pro Asp Tyr Leu Glu Ser Phe Gln Asp Leu Asp Leu Ser Asp Glu
 370 375 380
 Pro Asp Ile Asp Glu Asp Val Leu Arg Glu Ala Leu Arg Val Lys Asp
 385 390 395 400
 Tyr Met Gln Arg Tyr Gly Ile Asp Ala Glu Thr Ala Leu Ile Leu Cys
 405 410 415
 Lys Ala Pro Ile Ser Glu Asn Pro Ser His Pro Asp Leu Ser Lys Leu
 420 425 430
 Leu Ala Asp Ile His Gln Leu Thr Ile Asp Glu Leu Gly Val Leu Leu
 435 440 445
 Val Ala Ile Asp Glu Gly Lys Thr Asp Leu Ser Gln Ile Thr His Asp
 450 455 460
 Asn Leu Ala Val Leu Ile Ser Lys Leu Tyr Ser Val Thr Asn Trp Leu
 465 470 475 480
 Arg Thr Arg Lys Trp Ser Val Tyr Gln Leu Phe Val Met Thr Thr Asp
 485 490 495
 Lys Tyr Asn Lys Thr Leu Thr Pro Glu Ile Asn Asn Leu Leu Asp Thr
 500 505 510
 Val Tyr Asn Gly Leu Gln Asn Phe Tyr Lys Asp Asn Leu Leu Lys Ile
 515 520 525
 Lys Asp Asn Leu Leu Lys Ala Lys Glu Ser Leu Pro Glu Asp Lys Asp
 530 535 540
 Asn Leu Pro Lys Ala Glu Gln Tyr Leu Leu Glu Ala Glu Lys Tyr Leu
 545 550 555 560
 Leu Ala Ala Glu Lys Tyr Leu Leu Ala Ala Glu Lys Tyr Leu Leu Glu
 565 570 575
 Ala Asn Lys Asn Pro Leu Glu Ala Lys Lys Ala Leu Lys Glu Tyr Glu
 580 585 590
 Lys Asn Gln Glu Ala Tyr Glu Lys Asn Leu Lys Glu His Glu Lys Tyr
 595 600 605
 Leu Leu Lys Ala Gly Glu Asn Leu Pro Ala Ile Lys Glu Asn Leu Leu
 610 615 620
 Lys Ile Lys Glu Asn Leu Pro Lys Ala Ile Ser Pro Tyr Ile Ala Ala

625	630	635	640
Ala Leu Gln Leu Pro Ser Glu Asn Val Ala	Leu Ser Val Leu Ala Trp		
645	650	655	
Ala Asp Lys Leu Asn Ser Gly Lys Glu Asn Lys Met Thr Ala Asp Ser			
660	665	670	
Phe Trp Asn Trp Leu Arg Lys Lys Pro Ile Glu Thr Gln Ser Lys Thr			
675	680	685	
Thr Glu Ala Thr			
690	695	700	
Glu Ala Thr Glu Lys Thr Thr Leu Ile Gln Gln Ala Val Gln Tyr Cys			
705	710	715	720
Gln Cys Leu Ala Gln Leu Ala Ile Tyr Arg Ser Thr Gly Leu Ser			
725	730	735	
Glu Ser Thr Leu Arg Leu Phe Val Thr Asn Pro Gln Ile Phe Gly Leu			
740	745	750	
Thr Ala Lys Thr Thr Ser Thr His Asn Val Leu Ser Leu Ile Met Leu			
755	760	765	
Thr Arg Phe Thr Asp Trp Val Asn Ser Leu Gly Glu Asn Ala Ser Ser			
770	775	780	
Val Leu Thr Glu Phe Glu Lys Gly Thr Leu Thr Ala Glu Leu Leu Ala			
785	790	795	800
Asn Ala Met Asn Leu Asp Lys Asn Leu Leu Glu Gln Ala Ser Thr Gln			
805	810	815	
Ala Gln Ala Asp Phe Ser Asn Trp Pro Ser Ile Asp Asn Leu Leu Gln			
820	825	830	
Trp Ile Asn Ile Ser Arg Gln Leu Asn Ile Ser Pro Gln Gly Val Ser			
835	840	845	
Glu Leu Ala Lys Ile Leu Asp Ile Glu Ser Ser Thr Asn Tyr Ala Gln			
850	855	860	
Trp Glu Asn Val Ala Ser Ile Leu Thr Ala Gly Leu Asp Thr Gln Lys			
865	870	875	880
Ala Asn Thr Leu His Ala Phe Leu Gly Glu Ser Arg Ser Thr Ala Leu			
885	890	895	
Ser Thr Tyr Tyr Ile Tyr Ser His Asn Gln Lys Asp Arg Glu Glu Arg			
900	905	910	
Lys His Thr Val Ile Lys Asp Arg Asp Asp Leu Tyr Gln Tyr Leu Leu			
915	920	925	
Ile Asp Asn Gln Val Ser Ala Ala Ile Lys Thr Thr Glu Ile Ala Glu			
930	935	940	
Ala Ile Ala Ser Ile Gln Leu Tyr Ile Asn Arg Ala Leu Lys Asn Met			
945	950	955	960
Glu Gly Asp Thr Asp Thr Ser Val Thr Ser Arg Leu Phe Phe Thr Asn			
965	970	975	

Trp Asp Lys Tyr Asn Lys Arg Tyr Ser Thr Trp Ala Gly Ile Thr Lys
 980 985 990
 Leu Leu Tyr Tyr Pro Glu Asn Tyr Ile Asp Pro Thr Leu Arg Ile Gly
 995 1000 1005
 Gln Thr Lys Met Met Asp Thr Leu Leu Gln Ser Ile Ser Gln Ser
 1010 1015 1020
 Gln Leu Asn Thr Asp Thr Val Glu Asp Ala Phe Lys Ser Tyr Leu
 1025 1030 1035
 Thr Ser Phe Glu Gln Val Ala Asn Leu Glu Val Ile Ser Ala Tyr
 1040 1045 1050
 His Asp Asn Ile Asn Asn Asp Gln Gly Leu Thr Tyr Phe Ile Gly
 1055 1060 1065
 Arg Ser Lys Thr Glu Val Asn Gln Tyr Tyr Trp Arg Ser Val Asp
 1070 1075 1080
 His Asn Lys Phe Ser Glu Gly Lys Phe Pro Ala Asn Ala Trp Ser
 1085 1090 1095
 Glu Trp His Lys Ile Asp Cys Pro Ile Asn Pro Tyr Glu Asp Thr
 1100 1105 1110
 Ile Arg Pro Val Val Tyr Gln Ser Arg Leu Tyr Ile Ile Trp Leu
 1115 1120 1125
 Glu Gln Lys Lys Val Thr Asn Arg Ala Glu Gly Glu Ala Ile Lys
 1130 1135 1140
 Gln Gly Ser Lys Thr Thr Thr Ser Tyr His Tyr Glu Leu Lys Leu
 1145 1150 1155
 Ala His Ile Arg Tyr Asp Gly Thr Trp Asn Thr Pro Ile Thr Phe
 1160 1165 1170
 Asp Val Asp Glu Lys Ile Ser Gly Leu Asn Leu Glu Leu Asn Lys
 1175 1180 1185
 Ala Leu Gly Leu Tyr Cys Ala Ser Tyr Gln Gly Lys Asp Lys Leu
 1190 1195 1200
 Leu Val Met Phe Tyr Lys Lys Gln Glu Gln Leu Asn Asn Tyr Thr
 1205 1210 1215
 Glu Lys Thr Gly Asn Thr Tyr Thr Ala Pro Ile Lys Gly Leu Tyr
 1220 1225 1230
 Ile Thr Ser Asn Met Ser Pro Glu Glu Met Thr Pro Glu Ser Tyr
 1235 1240 1245
 Arg Leu Asn Ala His Lys Gln Phe Asp Thr Asn Asn Val Val Arg
 1250 1255 1260
 Val Asn Asn Arg Tyr Ala Glu Ser Tyr Glu Ile Pro Ser Ser Val
 1265 1270 1275
 Asn Ser Asn Asn Gly Tyr Asp Trp Gly Glu Gly Tyr Leu Ser Met
 1280 1285 1290

Val	Tyr	Gly	Gly	Ser	Ile	Leu	Ile	Thr	Arg	Asp	Pro	Ser	Asp	Asn
1295						1300					1305			
Ser	Lys	Ile	Gln	Ile	Ser	Pro	Lys	Leu	Arg	Ile	Ile	His	Asn	Gly
1310						1315					1320			
Tyr	Glu	Gly	Arg	Gln	Arg	Asn	Gln	Cys	Asn	Leu	Met	Lys	Lys	Tyr
1325						1330					1335			
Gly	Lys	Leu	Gly	Asp	Lys	Phe	Ile	Ile	Tyr	Thr	Thr	Leu	Gly	Ile
1340						1345					1350			
Asn	Pro	Asn	Asn	Leu	Ser	Asn	Lys	Lys	Leu	Ile	Tyr	Pro	Val	Tyr
1355						1360					1365			
Gln	Tyr	Glu	Gly	Asn	Glu	Ser	Lys	Leu	Ser	Gln	Gly	Arg	Leu	Leu
1370						1375					1380			
Phe	Tyr	Arg	Asp	Ser	Thr	Thr	Asn	Phe	Thr	Arg	Ala	Trp	Phe	Pro
1385						1390					1395			
Asn	Leu	Ser	Ser	Asp	Ser	Lys	Glu	Met	Ser	Ile	Thr	Thr	Gly	Gly
1400						1405					1410			
Asn	Ile	Ser	Gly	Asn	Tyr	Gly	Tyr	Ile	Asp	Asn	Lys	His	Ser	Asp
1415						1420					1425			
Asn	Lys	Pro	Phe	Glu	Glu	Tyr	Phe	Tyr	Met	Asp	Asp	His	Gly	Gly
1430						1435					1440			
Ile	Asp	Thr	Asp	Val	Ser	Glu	Pro	Ile	Phe	Ile	Asn	Thr	Lys	Ile
1445						1450					1455			
Gln	Pro	Ser	Asn	Val	Lys	Ile	Ile	Val	Lys	Thr	Val	Lys	Asp	Asp
1460						1465					1470			
Gly	Lys	Leu	Asp	Ser	Lys	Pro	Tyr	Ile	Ala	Glu	Asp	Lys	Val	Ser
1475						1480					1485			
Val	Lys	Pro	Thr	Pro	Asn	Phe	Glu	Glu	Met	Cys	Tyr	Gln	Phe	Asn
1490						1495					1500			
Asn	Leu	Asp	Gln	Ile	Asp	Val	Ser	Thr	Leu	Val	Phe	Lys	Asn	Asn
1505						1510					1515			
Glu	Ala	Ser	Ile	Asp	Ile	Thr	Phe	Thr	Ala	Ser	Ala	Asp	Ala	Phe
1520						1525					1530			
Glu	Ser	Gly	Lys	Glu	Gln	Arg	Asn	Leu	Gly	Glu	Glu	His	Phe	Ser
1535						1540					1545			
Ile	Arg	Ile	Ile	Lys	Lys	Ala	Asn	Val	Asn	Asp	Val	Leu	Thr	Leu
1550						1555					1560			
His	His	Asp	Pro	Ser	Gly	Ala	Gln	Tyr	Met	Gln	Trp	Gly	Ala	Tyr
1565						1570					1575			
Arg	Thr	Arg	Leu	Asn	Thr	Leu	Phe	Ala	Arg	Lys	Leu	Ile	Ser	Arg
1580						1585					1590			
Ala	Asn	Ala	Gly	Ile	Asp	Thr	Ile	Leu	Ser	Met	Glu	Thr	Gln	Asn
1595						1600					1605			
Ile	Gln	Glu	Pro	Gln	Leu	Gly	Lys	Gly	Phe	Tyr	Val	Asn	Phe	Thr

1610	1615	1620
Leu Pro Lys Tyr Asp Gln Asn	Thr His Gly Asn Glu	Arg Gln Phe
1625 1630	1635	
Lys Ile His Ile Gly Asn Ile	Ala Gly Asp Asn Thr	Met Arg Pro
1640 1645	1650	
Tyr Tyr Gln Gly Ile Leu Ala	Asp Thr Glu Thr Ser	Val Val Leu
1655 1660	1665	
Phe Val Pro Tyr Glu Lys Gln	Ser Tyr Thr Asn Glu	Gly Val Arg
1670 1675	1680	
Leu Gly Val Glu Tyr Lys Lys	Val Ser Tyr Leu Gly	Val Trp Glu
1685 1690	1695	
Pro Ala Phe Phe Tyr Phe Asn	Glu Ile Gln Gln Lys	Phe Ile Leu
1700 1705	1710	
Ile Asn Asp Ala Asp His Asn	Ser Ala Met Thr Gln	Ser Gly Glu
1715 1720	1725	
Lys Thr Gly Ile Lys Lys Tyr	Lys Gly Phe Leu Asp	Val Ser Ile
1730 1735	1740	
Leu Ile Asp His Gln His Thr	Glu Pro Met Asp Phe	Asn Gly Ala
1745 1750	1755	
Asn Ser Leu Tyr Phe Trp Glu	Leu Phe Tyr Tyr Thr	Pro Met Leu
1760 1765	1770	
Ile Ala Gln Arg Leu Leu His	Glu Gln Asn Phe Asp	Glu Ala Asn
1775 1780	1785	
Arg Trp Leu Lys Tyr Val Trp	Asn Pro Ser Gly His	Ile Ala Asn
1790 1795	1800	
Gly Gln Lys Gln His Pro His	Asn Trp Asn Val Arg	Pro Leu Gln
1805 1810	1815	
Glu Asp Thr Ser Trp Asn Asp	Asp Pro Leu Asp Thr	Phe Asp Pro
1820 1825	1830	
Asp Ala Ile Ala Gln His Asp	Pro Met His Tyr Lys	Val Ala Thr
1835 1840	1845	
Phe Met Cys Ala Leu Asp Leu	Leu Ile Glu Gln Gly	Asp Tyr Ala
1850 1855	1860	
Tyr Arg Gln Leu Glu Arg Asp	Thr Leu Ala Glu Ala	Lys Met Trp
1865 1870	1875	
Tyr Met Gln Ala Leu His Leu	Leu Gly Asp Lys Pro	His Leu Leu
1880 1885	1890	
Leu Ser Ser Thr Trp Ser Asp	Pro Glu Leu Lys Glu	Ala Ala Asp
1895 1900	1905	
Leu Glu Lys Gln Gln Ala His	Ala Lys Ala Ile Ala	Asp Leu Arg
1910 1915	1920	
Gln Gly Gln Pro Lys Asp Gly	Ser Asn Thr Asp Leu	Phe Leu Pro
1925 1930	1935	

Gln	Val	Asn	Glu	Val	Met	Leu	Ser	Tyr	Trp	Gln	Lys	Leu	Glu	Gln
1940						1945					1950			
Arg	Leu	Tyr	Asn	Leu	Arg	His	Asn	Leu	Ser	Ile	Asp	Gly	Gln	Pro
1955						1960					1965			
Leu	His	Leu	Pro	Ile	Phe	Ala	Thr	Pro	Ala	Asp	Pro	Lys	Ala	Leu
1970						1975					1980			
Leu	Ser	Ala	Ala	Val	Ala	Ser	Ser	Gln	Gly	Gly	Ser	Asn	Leu	Pro
1985						1990					1995			
Ser	Glu	Phe	Ile	Ser	Val	Trp	Arg	Phe	Pro	His	Met	Leu	Glu	Asn
2000						2005					2010			
Ala	Arg	Ser	Met	Val	Ser	Gln	Leu	Thr	Gln	Phe	Gly	Ser	Thr	Leu
2015						2020					2025			
Gln	Asn	Ile	Ile	Glu	Arg	Gln	Asp	Ala	Glu	Ala	Leu	Asn	Thr	Leu
2030						2035					2040			
Leu	Gln	Asn	Gln	Ala	Ala	Glu	Leu	Ile	Leu	Thr	Asn	Leu	Ser	Ile
2045						2050					2055			
Gln	Asp	Lys	Thr	Ile	Glu	Glu	Leu	Asp	Val	Glu	Lys	Thr	Val	Leu
2060						2065					2070			
Glu	Lys	Thr	Arg	Ala	Gly	Ala	Lys	Ser	Arg	Phe	Asp	Ser	Tyr	Ser
2075						2080					2085			
Lys	Phe	Tyr	Asp	Glu	Asp	Ile	Asn	Ala	Gly	Glu	Lys	Gln	Ala	Met
2090						2095					2100			
Ala	Leu	Arg	Ala	Ser	Val	Ala	Gly	Ile	Ser	Thr	Ala	Leu	Gln	Ala
2105						2110					2115			
Ser	His	Leu	Ala	Gly	Ala	Ala	Leu	Asp	Leu	Ala	Pro	Asn	Ile	Phe
2120						2125					2130			
Gly	Phe	Ala	Asp	Gly	Gly	Ser	His	Trp	Gly	Ala	Ile	Ala	Gln	Ala
2135						2140					2145			
Thr	Ser	Asn	Val	Met	Glu	Phe	Ser	Ala	Ser	Val	Met	Ser	Thr	Glu
2150						2155					2160			
Ala	Asp	Lys	Ile	Ser	Gln	Ser	Glu	Ala	Tyr	Arg	Arg	Arg	Arg	Gln
2165						2170					2175			
Glu	Trp	Lys	Ile	Gln	Arg	Asn	Asn	Ala	Asp	Ala	Glu	Leu	Lys	Gln
2180						2185					2190			
Ile	Asp	Ala	Gln	Leu	Gln	Ser	Leu	Val	Val	Arg	Arg	Glu	Ala	Ala
2195						2200					2205			
Val	Leu	Gln	Lys	Thr	Ser	Leu	Lys	Thr	Gln	Gln	Glu	Gln	Thr	His
2210						2215					2220			
Ala	Gln	Leu	Thr	Phe	Leu	Gln	His	Lys	Phe	Ser	Asn	Gln	Ala	Leu
2225						2230					2235			
Tyr	Asn	Trp	Leu	Arg	Gly	Arg	Leu	Ser	Ala	Ile	Tyr	Phe	Gln	Phe
2240						2245					2250			

Tyr Asp Leu Ala Val Ala Arg Cys Leu Met Ala Glu Met Ala Tyr
 2255 2260 2265
 Arg Trp Glu Thr Asn Asp Ala Ala Ala Arg Phe Ile Lys Pro Gly
 2270 2275 2280
 Ala Trp Gln Gly Thr His Ala Gly Leu Leu Ala Gly Glu Thr Leu
 2285 2290 2295
 Met Leu Asn Leu Ala Gln Met Glu Asp Ala His Leu Lys Gln Glu
 2300 2305 2310
 Gln Arg Val Leu Glu Val Glu Arg Thr Val Ser Leu Ala Glu Val
 2315 2320 2325
 Tyr Lys Glu Lys Gly Gln Phe Ser Leu Thr Lys Lys Ile Ala Glu
 2330 2335 2340
 Leu Val Asn Lys Lys Pro Asp Thr Thr Ser Ser Arg Asn Asn Thr
 2345 2350 2355
 Leu Asn Phe Gly Glu Gly Asn Ala Lys Thr Ser Leu Gln Ala Ser
 2360 2365 2370
 Ile Ser Leu Ala Asp Leu Gln Ile Arg His Asp Tyr Pro Glu Asn
 2375 2380 2385
 Ser Gly Ala Gly Asn Val Arg Arg Ile Lys Gln Ile Ser Val Thr
 2390 2395 2400
 Leu Pro Ala Leu Leu Gly Pro Tyr Gln Asp Val Gln Ala Ile Leu
 2405 2410 2415
 Ser Tyr Gly Gly Asp Ala Thr Gly Leu Ala Lys Gly Cys Lys Ala
 2420 2425 2430
 Leu Ala Val Ser His Gly Met Asn Asp Ser Gly Gln Phe Gln Leu
 2435 2440 2445
 Asp Phe Asn Asp Gly Lys Phe Leu Pro Phe Glu Gly Ile Glu Ile
 2450 2455 2460
 Asp Lys Gly Thr Leu Thr Leu Ser Phe Pro Asn Ala Thr Glu Lys
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 Lys Ala Asn Arg Leu His Glu Ala Ser Ile Leu Lys Arg Ala Asn Pro
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 Gln Leu Gln Asn Ala Val His Leu Ala Leu Thr Thr Pro His Ala Asp
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 Gln Gln Gly Tyr Asn Ser Lys Phe Gly Arg Ala Ser Gln Tyr Val
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 gct ccc ggc gca gtt gct tcc atg ttc tct ccc gcc gct tat ctg acc
 Ala Pro Gly Ala Val Ala Ser Met Phe Ser Pro Ala Ala Tyr Leu Thr
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 His Leu Asp Lys Arg Arg Pro Asp Leu Lys Ser Leu Thr Leu Ser Gln
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 Gln Asn Met Asp Asp Glu Val Ser Thr Leu Ser Leu Ser Asn Lys Val
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 Leu Leu Glu Gly Ile Lys Thr Leu Thr Gly Leu Glu Gly His Thr Asn
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 Val Met Lys Ala Leu Ser Thr Phe Arg Ser Ser Gly Ser Leu Pro Tyr
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Gln	Phe	Leu	Asn	His	Val	Leu	Ile	Glu	Ser	Asn	Ser	Thr	Tyr	Thr	Asn	
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Asn	Gln	Leu	Ile	Asn	Ile	Ser	Ile	Asp	Thr	Ser	Gly	Lys	Ile	Gln	Leu	
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Ser	Arg	Ile	Thr	Arg	Thr	Pro	Asp	Leu	Asn	Tyr	Asn	Asn	Leu	Asn	Tyr	
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Ser	Lys	Tyr	Leu	Lys	Gly	Ile	Tyr	Lys	Ala	Thr	Ile	Glu	Asn	Thr	Asn	
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Tyr	Ser	Ser	Pro	Thr	Phe	Glu	Leu	Thr	Asp	Lys	Asp	Ile	Gln	Lys	Glu	
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Phe	Thr	Leu	Leu	Ser	Tyr	Arg	Tyr	Lys	Glu	Asn	Ser	Asp	Ser	Asn	Ile	
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Ser	Asp	Ser	Ser	Tyr	Ala	Lys	Phe	Lys	Ile	Gln	Asp	Tyr	Ser	Pro	Ala	
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Ile	Phe	Leu	Leu	Lys	Leu	Asn	Lys	Thr	Ile	Arg	Leu	Ser	His	Ala	Thr	
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Lys	Leu	Leu	Pro	Thr	Val	Leu	Glu	Ile	Val	Phe	Asn	Ile	Asn	Gln		
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Lys	Leu	Asp	Ile	Asn	Ala	Glu	Ile	Leu	Lys	Lys	Ile	Phe	Arg	Val	Lys	
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Tyr	Tyr	Met	Gln	Arg	Tyr	Gly	Ile	Asp	Ala	Glu	Thr	Ala	Leu	Val	Leu	
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Cys	Lys	Val	Ser	Thr	Asn	Ile	Ile	Asn	Pro	Ser	Ser	Ser	Asp	Leu	Ile	
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Lys	Leu	Leu	Ala	Asn	Ile	His	Gln	Leu	Thr	Val	Asn	Glu	Leu	Asn	Leu	
485						490						495				
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gat	aac	aat	cta	tct	gtt	ctg	att	gat	aaa	ctt	tat	agc	att	acc	cag	1584
Asp	Asn	Asn	Leu	Ser	Val	Leu	Ile	Asp	Lys	Leu	Tyr	Ser	Ile	Thr	Gln	
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tgg	ttg	cgt	aca	cg	aaa	tgg	aat	atg	tac	ctg	ctg	ttt	atg	atg	act	1632
Trp	Leu	Arg	Thr	Arg	Lys	Trp	Asn	Met	Tyr	Leu	Leu	Phe	Met	Met	Thr	
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acc	acc	gac	tat	aac	caa	acc	ctg	acg	ccg	gaa	att	cag	aac	ctg	cta	1680
Thr	Thr	Asp	Tyr	Asn	Gln	Thr	Leu	Thr	Pro	Glu	Ile	Gln	Asn	Leu	Leu	
			545			550						555			560	
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Asn	Leu	Leu	Leu	Lys	Ile	Ser	Pro	Tyr	Ile	Ala	Ala	Ala	Leu	Gln	Leu	
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ccg	tct	gaa	aat	acc	gct	tat	tat	ata	ctc	aac	tgg	gca	gat	caa	cta	1824
Pro	Ser	Glu	Asn	Thr	Ala	Tyr	Tyr	Ile	Leu	Asn	Trp	Ala	Asp	Gln	Leu	
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Lys	Pro	Gly	Ser	Gly	Ala	Met	Thr	Ala	Thr	Lys	Phe	Trp	Glu	Trp	Leu	
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Gln	Ala	Ser	His	Asn	Pro	Glu	Gln	Ser	Thr	Ala	Ile	Thr	Glu	Glu	Gln	
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Ala	Val	Gln	Tyr	Cys	Gln	Cys	Leu	Ala	Gln	Leu	Ala	Leu	Ile	Tyr	Arg	
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Gln	Leu	Phe	Gly	Phe	Thr	Glu	Gly	Thr	Ala	Ser	Thr	His	Asn	Ala	Leu	
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Glu	Lys	Ala	Ser	Ser	Val	Leu	Thr	Glu	Phe	Glu	Lys	Gly	Thr	Leu	Thr	
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Gln	Ala	Ser	Asn	Gln	Ala	Gln	Val	Asn	Phe	Thr	Asp	Trp	Pro	Ser	Ile	
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Asp Thr Ile Gln Gln Trp Ile Asn Ile Ala Arg Gln Leu Asn Ile Ser			
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Pro Gln Asp Val Ser Ala Leu Ala Gln Val Leu Thr Thr Glu Ser Ser			
770	775	780	
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Asp Asn Tyr Ala Glu Trp Glu Asn Val Ala Ala Thr Leu Thr Ala Gly			
785	790	795	800
ctg gac acc caa aaa gcc aac gcc ctg cac acc ttt ctg gat gaa tct			2448
Leu Asp Thr Gln Lys Ala Asn Ala Leu His Thr Phe Leu Asp Glu Ser			
805	810	815	
cgt agt gct gca tta agc gag tac tat atc cgt aaa gtc gct aac gca			2496
Arg Ser Ala Ala Leu Ser Glu Tyr Tyr Ile Arg Lys Val Ala Asn Ala			
820	825	830	
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Gly Ala Lys Val Lys Asn His Asp Asp Leu Tyr Gln Tyr Leu Leu Ile			
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Asp Asn Gln Val Ser Ala Ala Ile Lys Thr Thr Pro Ile Ala Glu Ala			
850	855	860	
atc gcc agc atc caa ctg tat att aac cgg gca ctg aaa aat atg gag			2640
Ile Ala Ser Ile Gln Leu Tyr Ile Asn Arg Ala Leu Lys Asn Met Glu			
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Glu Asn Ala Val Ser Gln Val Val Thr Arg Pro Phe Phe Thr Asp Trp			
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Asp Lys Tyr Asn Lys Arg Tyr Ser Thr Trp Ala Ser Ile Ala Lys Leu			
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Ile Tyr Tyr Pro Glu Asn Tyr Ile Asp Pro Thr Ile Arg Ile Gly Arg			
915	920	925	
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Thr Lys Met Met Asp Thr Leu Leu Gln Ser Ile Ser Gln Ser Gln Leu			
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Asn Thr Asp Thr Val Glu Asp Ala Phe Met Ser Tyr Leu Thr Ser Phe			
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Glu Gln Ile Ala Asn Leu Glu Val Val Ser Ala Tyr His Asp Asn Ala			
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Lys Asp Asp Gln Arg Leu Thr Tyr Phe Ile Gly His Ser Lys Thr Glu			
980	985	990	
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Val Asn Gln Tyr Tyr Trp Arg Asn Val Asp His Asn Lys Phe Ser Asp			
995	1000	1005	
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Pro	Trp	Ser	Asn	Thr	Gln	Glu	Arg	Val	Glu	Ile	Ala	Val	Glu	Tyr	
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Asn	Lys	Lys	Phe	Tyr	Lys	Asp	Gln	Gln	Asn	Trp	Glu	Thr	Ala	Leu	
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Ala	Asp	Asn	Lys	Gln	Val	Val	Ile	Asn	Asp	Thr	Asp	Ala	Ile	Val	
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His	Thr	Glu	Pro	Met	Asp	Phe	Ser	Gly	Ala	Asn	Ser	Leu	Tyr	Phe	
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tgg	gaa	cta	ttc	tac	tat	gcc	cca	atg	ctg	att	gct	cag	cgc	ctg	4374
Trp	Glu	Leu	Phe	Tyr	Tyr	Ala	Pro	Met	Leu	Ile	Ala	Gln	Arg	Leu	
1445					1450					1455					
cta	cac	gaa	caa	cac	ttc	gat	gaa	gcc	aac	cgt	tgg	ttg	aaa	tat	4419
Leu	His	Glu	Gln	His	Phe	Asp	Glu	Ala	Asn	Arg	Trp	Leu	Lys	Tyr	
1460					1465					1470					
atc	tgg	aat	cca	tct	ggt	tat	att	gag	cat	ggt	cag	att	cag	cac	4464
Ile	Trp	Asn	Pro	Ser	Gly	Tyr	Ile	Glu	His	Gly	Gln	Ile	Gln	His	
1475					1480					1485					
tac	cgc	tgg	aat	gtc	cgc	cca	tta	ttg	gaa	gat	atc	agt	tgg	aac	4509

Tyr	Arg	Trp	Asn	Val	Arg	Pro	Leu	Leu	Glu	Asp	Ile	Ser	Trp	Asn	
1490						1495						1500			
gat	gat	cca	ctg	aat	tca	gtc	gat	ccc	gat	gcc	ata	gca	caa	tat	4554
Asp	Asp	Pro	Leu	Asn	Ser	Val	Asp	Pro	Asp	Ala	Ile	Ala	Gln	Tyr	
1505						1510						1515			
gat	cca	atg	cac	tat	aaa	gtc	gtt	act	ttt	atg	cgc	acc	ctt	gat	4599
Asp	Pro	Met	His	Tyr	Lys	Val	Val	Thr	Phe	Met	Arg	Thr	Leu	Asp	
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ctg	ttg	ctg	gac	cgt	gga	gat	tac	gcc	tat	cgt	cag	tta	gaa	cgg	4644
Leu	Leu	Leu	Asp	Arg	Gly	Asp	Tyr	Ala	Tyr	Arg	Gln	Leu	Glu	Arg	
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Asp	Thr	Leu	Asn	Glu	Ala	Lys	Met	Trp	Tyr	Met	Gln	Ala	Leu	His	
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Leu	Leu	Gly	Asp	Lys	Pro	His	Leu	Ser	Phe	Ser	Ser	Thr	Trp	Arg	
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aaa	ccg	agt	tta	ggt	gac	gct	gcc	aga	acg	gaa	aaa	cag	gag	gaa	4779
Lys	Pro	Ser	Leu	Gly	Asp	Ala	Ala	Arg	Thr	Glu	Lys	Gln	Glu	Glu	
1580						1585					1590				
caa	gcc	cat	gca	atg	act	gcc	ctg	cga	caa	ggt	gat	att	agt	cgg	4824
Gln	Ala	His	Ala	Met	Thr	Ala	Leu	Arg	Gln	Gly	Asp	Ile	Ser	Arg	
1595						1600					1605				
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His	Asn	His	Pro	Thr	Asp	Leu	Phe	Leu	Pro	Gln	Val	Asn	Glu	Val	
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atg	caa	aac	tac	tgg	cag	aaa	ctg	gag	caa	cg	ctg	tac	aac	ctg	4914
Met	Gln	Asn	Tyr	Trp	Gln	Lys	Leu	Glu	Gln	Arg	Leu	Tyr	Asn	Leu	
1625						1630					1635				
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Arg	His	Asn	Leu	Ser	Ile	Asp	Gly	Gln	Leu	Leu	His	Leu	Pro	Ile	
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Tyr	Ala	Thr	Pro	Ala	Asp	Pro	Lys	Ala	Leu	Leu	Ser	Ala	Ala	Val	
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gcc	aac	tca	caa	ggc	gga	agc	aag	tta	cca	atg	tca	ttt	atg	tca	5049
Ala	Asn	Ser	Gln	Gly	Gly	Ser	Lys	Leu	Pro	Met	Ser	Phe	Met	Ser	
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Leu	Trp	Arg	Phe	Pro	Gln	Met	Leu	Glu	Asn	Ala	Arg	Gly	Met	Val	
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Ser	Gln	Leu	Thr	Gln	Phe	Gly	Ser	Thr	Leu	Gln	Asn	Ile	Ile	Glu	
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cgt	cag	gat	gcg	gaa	gcc	tta	aac	acg	cta	ttg	cag	aat	caa	gcg	5184
Arg	Gln	Asp	Ala	Glu	Ala	Leu	Asn	Thr	Leu	Leu	Gln	Asn	Gln	Ala	
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Ala	Glu	Leu	Ile	Leu	Thr	Asn	Leu	Ser	Ile	Gln	Asp	Lys	Thr	Leu		
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Glu	Glu	Leu	Asp	Ala	Glu	Lys	Ile	Val	Leu	Glu	Lys	Ser	Lys	Ala		
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Gly	Ala	Gln	Ser	Arg	Phe	Asn	Ser	Tyr	Lys	Lys	Leu	Tyr	Asp	Glu		
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Asn	Ile	Asn	Ala	Gly	Glu	Asn	Arg	Val	Ile	Ala	Leu	His	Ser	Ser		
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Val	Ala	Gly	Leu	Ser	Thr	Ala	Leu	Gln	Ala	Ser	Arg	Leu	Ala	Gly		
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Ala	Ala	Leu	Asp	Leu	Ala	Pro	Asn	Ile	Phe	Gly	Phe	Ala	Asp	Gly		
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Glu	Phe	Ser	Ala	Asn	Val	Met	Asn	Thr	Glu	Ala	Asp	Lys	Ile	Ser		
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Gln	Ser	Glu	Thr	Tyr	Arg	Arg	Arg	Arg	Arg	Gln	Glu	Trp	Glu	Ile	Gln	
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Arg	Asn	Asn	Ala	Glu	Ala	Glu	Ile	Lys	Gln	Ile	Asp	Ala	Gln	Leu		
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Gln	Ser	Leu	Ala	Val	Arg	Arg	Glu	Ala	Ala	Val	Leu	Gln	Lys	Thr		
1880							1885					1890				
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Ser	Leu	Lys	Thr	Gln	Gln	Glu	Gln	Thr	Gln	Ala	Gln	Leu	Thr	Phe		
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Leu	Gln	Arg	Lys	Phe	Ser	Asn	Gln	Ala	Leu	Tyr	His	Trp	Leu	Arg		
1910							1915					1920				
ggt	cgg	cta	gct	gct	atc	tac	ttc	caa	ttt	tac	gat	ttg	gcc	gta	5814	
Gly	Arg	Leu	Ala	Ala	Ile	Tyr	Phe	Gln	Phe	Tyr	Asp	Leu	Ala	Val		
1925							1930					1935				
acc	cgt	tgt	ctg	atg	gca	gaa	atg	gct	tat	cgt	tgg	gag	act	cat	5859	
Thr	Arg	Cys	Leu	Met	Ala	Glu	Met	Ala	Tyr	Arg	Trp	Glu	Thr	His		
1940							1945					1950				
aat	acc	aca	gca	agc	ttt	atc	aaa	ccc	ggc	gcc	tgg	cag	ggg	acg	5904	
Asn	Thr	Thr	Ala	Ser	Phe	Ile	Lys	Pro	Gly	Ala	Trp	Gln	Gly	Thr		
1955							1960					1965				
cac	gct	ggt	ctg	ctc	gcc	ggt	gaa	acc	ttg	atg	ctg	aat	ctg	gca	5949	

His	Ala	Gly	Leu	Leu	Ala	Gly	Glu	Thr	Leu	Met	Leu	Asn	Leu	Ala	
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caa	atg	gag	gat	gct	tat	ttg	aga	tgg	gat	caa	cgc	gct	ctg	gaa	5994
Gln	Met	Glu	Asp	Ala	Tyr	Leu	Arg	Trp	Asp	Gln	Arg	Ala	Leu	Glu	
1985						1990					1995				
gtg	gaa	cgt	act	att	tca	ctg	gcg	caa	ctc	tat	gga	aca	cta	cca	6039
Val	Glu	Arg	Thr	Ile	Ser	Leu	Ala	Gln	Leu	Tyr	Gly	Thr	Leu	Pro	
2000						2005					2010				
gaa	aaa	tca	ttt	aat	ttg	gca	aca	cgt	att	tct	gcc	cta	cta	aca	6084
Glu	Lys	Ser	Phe	Asn	Leu	Ala	Thr	Arg	Ile	Ser	Ala	Leu	Leu	Thr	
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Gly	Ser	Thr	Thr	Glu	Pro	Val	Glu	Glu	His	Pro	Val	Thr	Leu	Glu	
2030						2035					2040				
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Asn	Gly	Gln	Leu	Ser	Ala	Lys	Ile	Ser	Leu	Ser	Gly	Leu	Ser	Leu	
2045						2050					2055				
cat	aat	gac	tac	cca	gaa	ggc	aat	ggc	gta	ggc	aac	att	cgg	cgc	6219
His	Asn	Asp	Tyr	Pro	Glu	Gly	Asn	Gly	Val	Gly	Asn	Ile	Arg	Arg	
2060						2065					2070				
att	aaa	cag	atc	agt	gtc	acc	ctg	cca	gct	ctg	tta	ggg	cca	tac	6264
Ile	Lys	Gln	Ile	Ser	Val	Thr	Leu	Pro	Ala	Leu	Leu	Gly	Pro	Tyr	
2075						2080					2085				
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Gln	Asn	Val	Gln	Ala	Ile	Leu	Ala	Tyr	Glu	Gly	Ser	Glu	Ile	Gly	
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tta	gct	gag	agc	tgt	aaa	tca	ctg	gca	att	tct	cat	ggg	gtt	aat	6354
Leu	Ala	Glu	Ser	Cys	Lys	Ser	Leu	Ala	Ile	Ser	His	Gly	Val	Asn	
2105						2110					2115				
gac	agt	ggg	caa	ttc	cag	ttg	gat	ttc	aac	aat	ggg	aaa	ttc	ctg	6399
Asp	Ser	Gly	Gln	Phe	Gln	Leu	Asp	Phe	Asn	Asn	Gly	Lys	Phe	Leu	
2120						2125					2130				
ccg	ttt	gaa	ggg	ata	gcg	att	aaa	cag	caa	gcc	aca	tta	aca	ctc	6444
Pro	Phe	Glu	Gly	Ile	Ala	Ile	Asn	Asp	Thr	Gly	Thr	Leu	Thr	Leu	
2135						2140					2145				
aat	ttc	ccg	aat	gcg	acc	ggc	aaa	cag	caa	gcc	atg	tta	caa	gca	6489
Asn	Phe	Pro	Asn	Ala	Thr	Gly	Lys	Gln	Gln	Ala	Met	Leu	Gln	Ala	
2150						2155					2160				
ttg	agc	gat	att	att	ctg	cat	att	cgc	tac	acc	atc	cgc	caa	taa	6534
Leu	Ser	Asp	Ile	Ile	Leu	His	Ile	Arg	Tyr	Thr	Ile	Arg	Gln		
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<213> <i>Photorhabdus luminescens</i>															
<400> 6															

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 1 5 10 15

Lys Ala Asn Arg Leu His Glu Ala Ser Ile Leu Lys Arg Ala Asn Pro
 20 25 30

Gln Leu Gln Asn Ala Val His Leu Ala Leu Thr Thr Pro His Ala Asp
 35 40 45

Gln Gln Gly Tyr Asn Ser Lys Phe Gly Gly Arg Ala Ser Gln Tyr Val
 50 55 60

Ala Pro Gly Ala Val Ala Ser Met Phe Ser Pro Ala Ala Tyr Leu Thr
 65 70 75 80

Glu Leu Tyr Arg Gln Ala Gln Asp Leu His Lys Lys Glu Ser Ile Tyr
 85 90 95

His Leu Asp Lys Arg Arg Pro Asp Leu Lys Ser Leu Thr Leu Ser Gln
 100 105 110

Gln Asn Met Asp Asp Glu Val Ser Thr Leu Ser Leu Ser Asn Lys Val
 115 120 125

Leu Leu Glu Gly Ile Lys Thr Leu Thr Gly Leu Glu Gly His Thr Asn
 130 135 140

Val Met Lys Ala Leu Ser Thr Phe Arg Ser Ser Gly Ser Leu Pro Tyr
 145 150 155 160

His Asp Ala Tyr Glu Ser Val Arg Lys Val Ile Gln Leu Gln Ala Pro
 165 170 175

Ile Phe Asp Gln Val Gly Pro Ser Pro Glu Thr Asp Ile Ala Asn Leu
 180 185 190

Thr Tyr Gln Ala Ser Leu Leu Gly Ile Asn Ala Ser Val Leu Pro Glu
 195 200 205

Leu Phe Lys Thr Leu Thr Glu Glu Ile Thr Glu Val Asn Ala Asn Glu
 210 215 220

Lys Phe Lys Lys Asn Phe Gly Asp Arg Glu Pro Ser Glu Leu Leu Thr
 225 230 235 240

Leu Asp Ala Leu Lys His Tyr Tyr Asn Leu Thr Asn Glu Glu Leu Glu
 245 250 255

Gln Phe Leu Asn His Val Leu Ile Glu Ser Asn Ser Thr Tyr Thr Asn
 260 265 270

Asn Gln Leu Ile Asn Ile Ser Ile Asp Thr Ser Gly Lys Ile Gln Leu
 275 280 285

Ser Arg Ile Thr Arg Thr Pro Asp Leu Asn Tyr Asn Asn Leu Asn Tyr
 290 295 300

Met Asn Leu Tyr Pro Ile Gln Asn Arg Arg Phe Tyr Val Asp Ile Ser
 305 310 315 320

Tyr Lys Lys Lys Ala Gly Gln Val Ser Ile Arg Leu Ser Lys Pro Gln
 325 330 335

Ser Lys Tyr Leu Lys Gly Ile Tyr Lys Ala Thr Ile Glu Asn Thr Asn
 340 345 350
 Tyr Ser Ser Pro Thr Phe Glu Leu Thr Asp Lys Asp Ile Gln Lys Glu
 355 360 365
 Phe Thr Leu Leu Ser Tyr Arg Tyr Lys Glu Asn Ser Asp Ser Asn Ile
 370 375 380
 Ser Asp Ser Ser Tyr Ala Lys Phe Lys Ile Gln Asp Tyr Ser Pro Ala
 385 390 395 400
 Ile Phe Leu Leu Lys Leu Asn Lys Thr Ile Arg Leu Ser His Ala Thr
 405 410 415
 Lys Leu Leu Pro Thr Val Leu Glu Lys Ile Val Phe Asn Ile Asn Gln
 420 425 430
 Lys Leu Asp Ile Asn Ala Glu Ile Leu Lys Lys Ile Phe Arg Val Lys
 435 440 445
 Tyr Tyr Met Gln Arg Tyr Gly Ile Asp Ala Glu Thr Ala Leu Val Leu
 450 455 460
 Cys Lys Val Ser Thr Asn Ile Ile Asn Pro Ser Ser Ser Asp Leu Ile
 465 470 475 480
 Lys Leu Leu Ala Asn Ile His Gln Leu Thr Val Asn Glu Leu Asn Leu
 485 490 495
 Leu Leu Val Ala Ile Gly Glu Gly Ser Thr Asn Leu Ser Glu Leu Ser
 500 505 510
 Asp Asn Asn Leu Ser Val Leu Ile Asp Lys Leu Tyr Ser Ile Thr Gln
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 Trp Leu Arg Thr Arg Lys Trp Asn Met Tyr Leu Leu Phe Met Met Thr
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 Thr Thr Asp Tyr Asn Gln Thr Leu Thr Pro Glu Ile Gln Asn Leu Leu
 545 550 555 560
 Asp Ala Val Tyr Asn Gly Leu Gln Asn Phe Asn Ser Lys Asn Glu Ala
 565 570 575
 Asn Leu Leu Leu Lys Ile Ser Pro Tyr Ile Ala Ala Ala Leu Gln Leu
 580 585 590
 Pro Ser Glu Asn Thr Ala Tyr Tyr Ile Leu Asn Trp Ala Asp Gln Leu
 595 600 605
 Lys Pro Gly Ser Gly Ala Met Thr Ala Thr Lys Phe Trp Glu Trp Leu
 610 615 620
 Gln Ala Ser His Asn Pro Glu Gln Ser Thr Ala Ile Thr Glu Glu Gln
 625 630 635 640
 Ala Val Gln Tyr Cys Gln Cys Leu Ala Gln Leu Ala Leu Ile Tyr Arg
 645 650 655
 Ser Thr Gly Leu Ser Glu Ser Thr Leu Arg Leu Phe Val Thr Lys Pro
 660 665 670
 Gln Leu Phe Gly Phe Thr Glu Gly Thr Ala Ser Thr His Asn Ala Leu

675	680	685
Ser Leu Ile Lys Leu Thr Arg Phe Thr Asp Trp Val Asn Ser Leu Gly		
690	695	700
Glu Lys Ala Ser Ser Val Leu Thr Glu Phe Glu Lys Gly Thr Leu Thr		
705	710	715
720		
Ala Glu Leu Leu Ala Asn Ala Leu Ser Leu Asp Lys Asn Leu Leu Glu		
725	730	735
Gln Ala Ser Asn Gln Ala Gln Val Asn Phe Thr Asp Trp Pro Ser Ile		
740	745	750
Asp Thr Ile Gln Gln Trp Ile Asn Ile Ala Arg Gln Leu Asn Ile Ser		
755	760	765
Pro Gln Asp Val Ser Ala Leu Ala Gln Val Leu Thr Thr Glu Ser Ser		
770	775	780
Asp Asn Tyr Ala Glu Trp Glu Asn Val Ala Ala Thr Leu Thr Ala Gly		
785	790	795
800		
Leu Asp Thr Gln Lys Ala Asn Ala Leu His Thr Phe Leu Asp Glu Ser		
805	810	815
Arg Ser Ala Ala Leu Ser Glu Tyr Tyr Ile Arg Lys Val Ala Asn Ala		
820	825	830
Gly Ala Lys Val Lys Asn His Asp Asp Leu Tyr Gln Tyr Leu Leu Ile		
835	840	845
Asp Asn Gln Val Ser Ala Ala Ile Lys Thr Thr Pro Ile Ala Glu Ala		
850	855	860
Ile Ala Ser Ile Gln Leu Tyr Ile Asn Arg Ala Leu Lys Asn Met Glu		
865	870	875
880		
Glu Asn Ala Val Ser Gln Val Val Thr Arg Pro Phe Phe Thr Asp Trp		
885	890	895
Asp Lys Tyr Asn Lys Arg Tyr Ser Thr Trp Ala Ser Ile Ala Lys Leu		
900	905	910
Ile Tyr Tyr Pro Glu Asn Tyr Ile Asp Pro Thr Ile Arg Ile Gly Arg		
915	920	925
Thr Lys Met Met Asp Thr Leu Leu Gln Ser Ile Ser Gln Ser Gln Leu		
930	935	940
Asn Thr Asp Thr Val Glu Asp Ala Phe Met Ser Tyr Leu Thr Ser Phe		
945	950	955
960		
Glu Gln Ile Ala Asn Leu Glu Val Val Ser Ala Tyr His Asp Asn Ala		
965	970	975
Lys Asp Asp Gln Arg Leu Thr Tyr Phe Ile Gly His Ser Lys Thr Glu		
980	985	990
Val Asn Gln Tyr Tyr Trp Arg Asn Val Asp His Asn Lys Phe Ser Asp		
995	1000	1005
Asp Lys Phe Pro Ala Asn Ala Trp Ser Glu Trp His Lys Ile Asp		
1010	1015	1020

Cys	Pro	Ile	Asn	Pro	Tyr	Gln	Gly	Thr	Ile	His	Pro	Val	Ile	Phe
1025	.					1030					1035			
Gln	Ser	Arg	Leu	Tyr	Leu	Ile	Trp	Leu	Glu	Gln	Lys	Lys	Ile	Ala
1040						1045					1050			
Lys	Gln	Ala	Asp	Asn	Asn	Gln	Thr	Val	Glu	Asp	Tyr	Tyr	Tyr	Glu
1055						1060					1065			
Leu	Lys	Leu	Ala	His	Ile	Arg	Tyr	Asp	Gly	Thr	Trp	Asn	Thr	Pro
1070						1075					1080			
Val	Ala	Phe	Asn	Ile	Asn	Asp	Lys	Val	Ser	Ala	Val	Leu	Lys	Met
1085						1090					1095			
Ser	Asn	Pro	Pro	Ala	Thr	Ser	Glu	Leu	Leu	Glu	Ser	Pro	Glu	Ser
1100						1105					1110			
Leu	Lys	Leu	Gly	Phe	Tyr	Cys	Thr	Asn	His	Gln	Asp	Asn	Lys	Leu
1115						1120					1125			
Leu	Val	Met	Phe	Tyr	Arg	Lys	Arg	Asp	Glu	Leu	Asp	Glu	Tyr	Lys
1130						1135					1140			
Arg	Thr	Leu	Lys	Glu	Leu	Ala	Glu	Ala	Glu	Lys	Lys	Val	Lys	Glu
1145						1150					1155			
Ile	Ala	Lys	Lys	Ile	Asp	Arg	Glu	Asp	Gly	Ile	Ser	Val	Ser	Asp
1160						1165					1170			
His	Gln	Glu	Lys	Gln	Thr	Ala	Glu	Lys	Lys	Leu	Lys	Glu	Leu	Ile
1175						1180					1185			
Gln	Glu	Leu	Met	Gln	Gly	Val	Tyr	Ile	Ser	Ser	Asn	Met	Leu	Leu
1190						1195					1200			
Glu	Asn	Ile	Glu	Ser	Glu	Gln	Tyr	Lys	Asn	Ile	Tyr	Glu	Leu	Thr
1205						1210					1215			
Tyr	Ser	Lys	Phe	Asp	Ile	Asn	Asn	Ile	Ile	Lys	Val	Asn	Ser	Trp
1220						1225					1230			
Asn	Pro	Val	Thr	Asp	Glu	Val	Asn	Asp	Asp	Asn	Ile	Leu	Thr	Val
1235						1240					1245			
His	Asn	Asp	Thr	Asn	Gly	Ala	Gln	Tyr	Met	Gln	Ser	Gly	Gly	Tyr
1250						1255					1260			
Arg	Thr	Arg	Leu	Asn	Thr	Leu	Phe	Ala	Arg	Lys	Leu	Ile	Ser	Arg
1265						1270					1275			
Ala	Thr	Ala	Gly	Ile	Asp	Thr	Ile	Leu	Asn	Ile	Glu	Thr	Gln	Lys
1280						1285					1290			
Leu	Pro	Glu	Pro	Gln	Leu	Gly	Lys	Gly	Phe	Phe	Thr	Asn	Leu	Ile
1295						1300					1305			
Leu	Pro	Lys	Tyr	Asp	Gln	Asn	Val	His	Gly	Ser	Glu	Arg	Trp	Phe
1310						1315					1320			
Lys	Ile	His	Ile	Arg	Asn	Asp	Asn	Lys	Met	Met	Asn	Leu	Tyr	His
1325						1330					1335			

Lys Gly Thr Leu Thr Asp Thr Glu Thr Ser Val Thr Leu Phe Ile
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 Pro Trp Ser Asn Thr Gln Glu Arg Val Glu Ile Ala Val Glu Tyr
 1355 1360 1365
 Asn Lys Lys Phe Tyr Lys Asp Gln Gln Asn Trp Glu Thr Ala Leu
 1370 1375 1380
 Phe His Phe Asn Glu Thr Asn Gln Lys Phe Met Leu Val Asn Asp
 1385 1390 1395
 Ala Asp Asn Lys Gln Val Val Ile Asn Asp Thr Asp Ala Ile Val
 1400 1405 1410
 Asn Lys Tyr Lys Gly Phe Leu Asp Val Ser Ile Leu Ile Asp Gln
 1415 1420 1425
 His Thr Glu Pro Met Asp Phe Ser Gly Ala Asn Ser Leu Tyr Phe
 1430 1435 1440
 Trp Glu Leu Phe Tyr Tyr Ala Pro Met Leu Ile Ala Gln Arg Leu
 1445 1450 1455
 Leu His Glu Gln His Phe Asp Glu Ala Asn Arg Trp Leu Lys Tyr
 1460 1465 1470
 Ile Trp Asn Pro Ser Gly Tyr Ile Glu His Gly Gln Ile Gln His
 1475 1480 1485
 Tyr Arg Trp Asn Val Arg Pro Leu Leu Glu Asp Ile Ser Trp Asn
 1490 1495 1500
 Asp Asp Pro Leu Asn Ser Val Asp Pro Asp Ala Ile Ala Gln Tyr
 1505 1510 1515
 Asp Pro Met His Tyr Lys Val Val Thr Phe Met Arg Thr Leu Asp
 1520 1525 1530
 Leu Leu Leu Asp Arg Gly Asp Tyr Ala Tyr Arg Gln Leu Glu Arg
 1535 1540 1545
 Asp Thr Leu Asn Glu Ala Lys Met Trp Tyr Met Gln Ala Leu His
 1550 1555 1560
 Leu Leu Gly Asp Lys Pro His Leu Ser Phe Ser Ser Thr Trp Arg
 1565 1570 1575
 Lys Pro Ser Leu Gly Asp Ala Ala Arg Thr Glu Lys Gln Glu Glu
 1580 1585 1590
 Gln Ala His Ala Met Thr Ala Leu Arg Gln Gly Asp Ile Ser Arg
 1595 1600 1605
 His Asn His Pro Thr Asp Leu Phe Leu Pro Gln Val Asn Glu Val
 1610 1615 1620
 Met Gln Asn Tyr Trp Gln Lys Leu Glu Gln Arg Leu Tyr Asn Leu
 1625 1630 1635
 Arg His Asn Leu Ser Ile Asp Gly Gln Leu Leu His Leu Pro Ile
 1640 1645 1650
 Tyr Ala Thr Pro Ala Asp Pro Lys Ala Leu Leu Ser Ala Ala Val

1655	1660	1665
Ala Asn Ser Gln Gly Gly	Ser Lys Leu Pro Met	Ser Phe Met Ser
1670 1675	1680	
Leu Trp Arg Phe Pro Gln Met	Leu Glu Asn Ala	Arg Gly Met Val
1685 1690	1695	
Ser Gln Leu Thr Gln Phe Gly	Ser Thr Leu Gln Asn	Ile Ile Glu
1700 1705	1710	
Arg Gln Asp Ala Glu Ala	Leu Asn Thr Leu Leu	Gln Asn Gln Ala
1715 1720	1725	
Ala Glu Leu Ile Leu Thr Asn	Leu Ser Ile Gln Asp	Lys Thr Leu
1730 1735	1740	
Glu Glu Leu Asp Ala Glu Lys	Ile Val Leu Glu Lys	Ser Lys Ala
1745 1750	1755	
Gly Ala Gln Ser Arg Phe Asn	Ser Tyr Lys Lys Leu	Tyr Asp Glu
1760 1765	1770	
Asn Ile Asn Ala Gly Glu Asn	Arg Val Ile Ala	Leu His Ser Ser
1775 1780	1785	
Val Ala Gly Leu Ser Thr Ala	Leu Gln Ala Ser Arg	Leu Ala Gly
1790 1795	1800	
Ala Ala Leu Asp Leu Ala Pro	Asn Ile Phe Gly Phe	Ala Asp Gly
1805 1810	1815	
Gly Ser Arg Trp Gly Ala Ile	Ala Glu Ala Thr Gly	Asn Val Met
1820 1825	1830	
Glu Phe Ser Ala Asn Val Met	Asn Thr Glu Ala Asp	Lys Ile Ser
1835 1840	1845	
Gln Ser Glu Thr Tyr Arg Arg	Arg Arg Gln Glu Trp	Glu Ile Gln
1850 1855	1860	
Arg Asn Asn Ala Glu Ala Glu	Ile Lys Gln Ile Asp	Ala Gln Leu
1865 1870	1875	
Gln Ser Leu Ala Val Arg Arg	Glu Ala Ala Val Leu	Gln Lys Thr
1880 1885	1890	
Ser Leu Lys Thr Gln Gln Glu	Gln Thr Gln Ala Gln	Leu Thr Phe
1895 1900	1905	
Leu Gln Arg Lys Phe Ser Asn	Gln Ala Leu Tyr His	Trp Leu Arg
1910 1915	1920	
Gly Arg Leu Ala Ala Ile Tyr	Phe Gln Phe Tyr Asp	Leu Ala Val
1925 1930	1935	
Thr Arg Cys Leu Met Ala Glu	Met Ala Tyr Arg Trp	Glu Thr His
1940 1945	1950	
Asn Thr Thr Ala Ser Phe Ile	Lys Pro Gly Ala Trp	Gln Gly Thr
1955 1960	1965	
His Ala Gly Leu Leu Ala Gly	Glu Thr Leu Met Leu	Asn Leu Ala
1970 1975	1980	

Gln	Met	Glu	Asp	Ala	Tyr	Leu	Arg	Trp	Asp	Gln	Arg	Ala	Leu	Glu		
1985						1990					1995					
Val	Glu	Arg	Thr	Ile	Ser	Leu	Ala	Gln	Leu	Tyr	Gly	Thr	Leu	Pro		
2000						2005					2010					
Glu	Lys	Ser	Phe	Asn	Leu	Ala	Thr	Arg	Ile	Ser	Ala	Leu	Leu	Thr		
2015						2020					2025					
Gly	Ser	Thr	Thr	Glu	Pro	Val	Glu	Glu	His	Pro	Val	Thr	Leu	Glu		
2030						2035					2040					
Asn	Gly	Gln	Leu	Ser	Ala	Lys	Ile	Ser	Leu	Ser	Gly	Leu	Ser	Leu		
2045						2050					2055					
His	Asn	Asp	Tyr	Pro	Glu	Gly	Asn	Gly	Val	Gly	Asn	Ile	Arg	Arg		
2060						2065					2070					
Ile	Lys	Gln	Ile	Ser	Val	Thr	Leu	Pro	Ala	Leu	Leu	Gly	Pro	Tyr		
2075						2080					2085					
Gln	Asn	Val	Gln	Ala	Ile	Leu	Ala	Tyr	Glu	Gly	Ser	Glu	Ile	Gly		
2090						2095					2100					
Leu	Ala	Glu	Ser	Cys	Lys	Ser	Leu	Ala	Ile	Ser	His	Gly	Val	Asn		
2105						2110					2115					
Asp	Ser	Gly	Gln	Phe	Gln	Leu	Asp	Phe	Asn	Asn	Gly	Lys	Phe	Leu		
2120						2125					2130					
Pro	Phe	Glu	Gly	Ile	Ala	Ile	Asn	Asp	Thr	Gly	Thr	Leu	Thr	Leu		
2135						2140					2145					
Asn	Phe	Pro	Asn	Ala	Thr	Gly	Lys	Gln	Gln	Ala	Met	Leu	Gln	Ala		
2150						2155					2160					
Leu	Ser	Asp	Ile	Ile	Leu	His	Ile	Arg	Tyr	Thr	Ile	Arg	Gln			
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Met	Asn	Ser	Tyr	Val	Lys	Glu	Ile	Pro	Asp	Val	Leu	Gln	Ser	Gln	Tyr	
1				5					10				15			
ggt att aat tgt ctg aca gat att tgc cac tat tct ttt aat gaa ttt															96	
Gly	Ile	Asn	Cys	Leu	Thr	Asp	Ile	Cys	His	Tyr	Ser	Phe	Asn	Glu	Phe	
20									25				30			
cgt cag caa gtc tct gat cat ctc tcc tgg tca gag acc aac cgc tta															144	

Arg Gln Gln Val Ser Asp His Leu Ser Trp Ser Glu Thr Asn Arg Leu			
35	40	45	
tat cgt gat gca caa cag gaa caa aaa gag aat caa tta tat gaa gct			192
Tyr Arg Asp Ala Gln Gln Glu Gln Lys Glu Asn Gln Leu Tyr Glu Ala			
50	55	60	
cgt att ctt aaa cgc gct aac ccg cag ttg caa aat gca gtg cac ctc			240
Arg Ile Leu Lys Arg Ala Asn Pro Gln Leu Gln Asn Ala Val His Leu			
65	70	75	80
ggt att acc ctc cct cat gct gaa tta cga ggc tat aat agt gaa ttc			288
Gly Ile Thr Leu Pro His Ala Glu Leu Arg Gly Tyr Asn Ser Glu Phe			
85	90	95	
ggt ggc cga gcc agc caa tat gtg gcg ccg ggt tcg gtt tcc tct atg			336
Gly Gly Arg Ala Ser Gln Tyr Val Ala Pro Gly Ser Val Ser Ser Met			
100	105	110	
ttc tcc ccc gca gct tat tta act gaa ctc tat cgt gaa gca cgt aat			384
Phe Ser Pro Ala Ala Tyr Leu Thr Glu Leu Tyr Arg Glu Ala Arg Asn			
115	120	125	
tta cat gcc agc gac tcc gtt tat cat ctg gat gaa cgc cgc cca gac			432
Leu His Ala Ser Asp Ser Val Tyr His Leu Asp Glu Arg Arg Pro Asp			
130	135	140	
ctc caa tca atg acg ctc agc cag caa aat atg gat acc gaa ctt tcc			480
Leu Gln Ser Met Thr Leu Ser Gln Gln Asn Met Asp Thr Glu Leu Ser			
145	150	155	160
act ctt tct ctg tct aat gaa att ttg ttg aaa gga att aaa gct aat			528
Thr Leu Ser Leu Ser Asn Glu Ile Leu Leu Lys Gly Ile Lys Ala Asn			
165	170	175	
cag tct aat ctg gac agc gat act aag gtg atg gaa atg tta tcc act			576
Gln Ser Asn Leu Asp Ser Asp Thr Lys Val Met Glu Met Leu Ser Thr			
180	185	190	
ttc cgt cct tcc ggc acg ata cct tat cat gat gct tac gaa aat gta			624
Phe Arg Pro Ser Gly Thr Ile Pro Tyr His Asp Ala Tyr Glu Asn Val			
195	200	205	
cgt aaa gct atc caa tta caa gat ccg aaa ctt gaa caa ttt cag aaa			672
Arg Lys Ala Ile Gln Leu Gln Asp Pro Lys Leu Glu Gln Phe Gln Lys			
210	215	220	
tca ccg gcg gtc gcc gga tta atg cat caa gct tca tta tta gga att			720
Ser Pro Ala Val Ala Gly Leu Met His Gln Ala Ser Leu Leu Gly Ile			
225	230	235	240
aat aac tct atc tca cca gaa ctg ttt aat att ctg aca gaa gag att			768
Asn Asn Ser Ile Ser Pro Glu Leu Phe Asn Ile Leu Thr Glu Glu Ile			
245	250	255	
acc gaa gct aac gca gag gca att tat aaa cag aat ttt ggc gat att			816
Thr Glu Ala Asn Ala Glu Ala Ile Tyr Lys Gln Asn Phe Gly Asp Ile			
260	265	270	
gac cct gcc tgc ctg gca atg ccg gaa tat ctg aaa agt tat tat aat			864
Asp Pro Ala Cys Leu Ala Met Pro Glu Tyr Leu Lys Ser Tyr Tyr Asn			
275	280	285	
ttt agt gat gaa gaa ctc agt caa ttt att cgc aaa tat cca gat aat			912

Phe	Ser	Asp	Glu	Glu	Leu	Ser	Gln	Phe	Ile	Arg	Lys	Tyr	Pro	Asp	Asn	
290						295					300					
gaa	cta	aat	act	cag	aaa	ata	cat	tta	cta	aaa	atc	aat	aaa	att	att	960
Glu	Leu	Asn	Thr	Gln	Lys	Ile	His	Leu	Leu	Lys	Ile	Asn	Lys	Ile	Ile	
305					310					315					320	
tta	tta	tcg	caa	gcc	gtg	aat	ctg	ccg	ttt	tta	aag	tta	gat	gaa	att	1008
Leu	Leu	Ser	Gln	Ala	Val	Asn	Leu	Pro	Phe	Leu	Lys	Leu	Asp	Glu	Ile	
															335	
325									330							
att	cca	gaa	cag	aac	att	acc	ccg	aca	gta	tta	ggg	aaa	atc	ttt	cta	1056
Ile	Pro	Glu	Gln	Asn	Ile	Thr	Pro	Thr	Val	Leu	Gly	Lys	Ile	Phe	Leu	
															350	
340									345							
gtt	aaa	tat	tat	atg	cag	aaa	tac	aat	att	ggt	acg	gaa	act	gcc	tta	1104
Val	Lys	Tyr	Tyr	Met	Gln	Lys	Tyr	Asn	Ile	Gly	Thr	Glu	Thr	Ala	Leu	
									355			365				
355									360							
ata	tta	tgt	aat	gat	tcc	att	tca	caa	tac	tcc	tat	agt	aat	caa	cct	1152
Ile	Leu	Cys	Asn	Asp	Ser	Ile	Ser	Gln	Tyr	Ser	Tyr	Ser	Asn	Gln	Pro	
									370			380				
370									375							
agc	caa	ttt	gat	cgc	cta	ttt	aat	acc	tcg	cca	ctc	aat	gga	caa	tat	1200
Ser	Gln	Phe	Asp	Arg	Leu	Phe	Asn	Thr	Ser	Pro	Leu	Asn	Gly	Gln	Tyr	
									385			395			400	
385									390							
ttc	gtt	atc	gaa	gac	act	aat	att	gac	cta	agt	ctg	aac	agt	acc	gat	1248
Phe	Val	Ile	Glu	Asp	Thr	Asn	Ile	Asp	Leu	Ser	Leu	Asn	Ser	Thr	Asp	
									405			410			415	
405																
aac	tgg	cac	aaa	gca	gta	ctt	aaa	cgt	gct	ttt	aat	gtc	gat	gat	att	1296
Asn	Trp	His	Lys	Ala	Val	Leu	Lys	Arg	Ala	Phe	Asn	Val	Asp	Asp	Ile	
									420			425			430	
420																
tcc	ctc	tat	cgt	tta	ctc	cat	att	gcc	aat	cat	aac	aat	acc	gat	gga	1344
Ser	Leu	Tyr	Arg	Leu	Leu	His	Ile	Ala	Asn	His	Asn	Asn	Thr	Asp	Gly	
									435			440			445	
435																
aaa	att	gct	aat	ata	aaa	aat	ctt	tcc	aat	ctt	tat	atg	act	aaa		1392
Lys	Ile	Ala	Asn	Asn	Ile	Lys	Asn	Leu	Ser	Asn	Leu	Tyr	Met	Thr	Lys	
									450			455			460	
450																
cta	ctg	gca	gat	att	cat	caa	tta	acg	att	gat	gaa	ctg	tat	tta	cta	1440
Leu	Leu	Ala	Asp	Ile	His	Gln	Leu	Thr	Ile	Asp	Glu	Leu	Tyr	Leu	Leu	
									465			470			480	
465																
ctg	ata	act	att	ggt	gaa	gat	aaa	ata	aat	tta	tat	gat	att	gat	gat	1488
Leu	Ile	Thr	Ile	Gly	Glu	Asp	Lys	Ile	Asn	Leu	Tyr	Asp	Ile	Asp	Asp	
									485			490			495	
485																
aaa	gag	ctg	gag	aaa	ctc	ata	aac	aga	ctc	gat	acc	cta	agc	aat	tgg	1536
Lys	Glu	Leu	Glu	Lys	Leu	Ile	Asn	Arg	Leu	Asp	Thr	Leu	Ser	Asn	Trp	
									500			505			510	
500																
ctg	cat	aca	caa	aag	tgg	agt	atc	tat	cag	tta	ttt	ttg	atg	acc	acc	1584
Leu	His	Thr	Gln	Lys	Trp	Ser	Ile	Tyr	Gln	Leu	Phe	Leu	Met	Thr	Thr	
									515			520			525	
515																
acc	aac	tat	gac	aaa	aca	cta	acg	cct	gaa	att	caa	aac	tta	ctc	gat	1632
Thr	Asn	Tyr	Asp	Lys	Thr	Leu	Thr	Pro	Glu	Ile	Gln	Asn	Leu	Leu	Asp	
									530			535			540	
530																
acg	gtc	tac	aat	ggc	tta	cag	aac	tcc	gat	aaa	aat	aaa	acc	aaa	ctt	1680

Thr Val Tyr Asn Gly Leu Gln Asn Phe Asp Lys Asn Lys Thr Lys Leu				
545	550	555	560	
ctg gca gcc atc gcg cct tat att gct gca aca cta caa tta cca tct				1728
Leu Ala Ala Ile Ala Pro Tyr Ile Ala Ala Thr Leu Gln Leu Pro Ser				
565	570	575		
gaa aat gtc gca cat tct att ctt ctc tgg gct gat aag ata aaa cca				1776
Glu Asn Val Ala His Ser Ile Leu Leu Trp Ala Asp Lys Ile Lys Pro				
580	585	590		
agc gaa aat aaa ata acg gca gaa aaa ttt tgg atc tgg tta caa aat				1824
Ser Glu Asn Lys Ile Thr Ala Glu Lys Phe Trp Ile Trp Leu Gln Asn				
595	600	605		
aga gat act aca gaa ttg tca aaa ccg cca gaa atg cag gaa caa att				1872
Arg Asp Thr Thr Glu Leu Ser Lys Pro Pro Glu Met Gln Glu Gln Ile				
610	615	620		
att cag tac tgc cac tgt ctg gca caa ttg aca atg att tat cgt tct				1920
Ile Gln Tyr Cys His Cys Leu Ala Gln Leu Thr Met Ile Tyr Arg Ser				
625	630	635	640	
tcc ggc att aat gaa aac gct ttc cgt cta ttt atc gaa aag cca act				1968
Ser Gly Ile Asn Glu Asn Ala Phe Arg Leu Phe Ile Glu Lys Pro Thr				
645	650	655		
att ttt ggc atc cct gat gaa ccg aat aaa gcg aca cca gcc cat aat				2016
Ile Phe Gly Ile Pro Asp Glu Pro Asn Lys Ala Thr Pro Ala His Asn				
660	665	670		
gca cca aca tta atc atc cta acc cgc ttt gcc aat tgg gtt aat tct				2064
Ala Pro Thr Leu Ile Ile Leu Thr Arg Phe Ala Asn Trp Val Asn Ser				
675	680	685		
cta ggt gaa aaa gcc tcc cct att cta acg gct ttt gaa aat aaa acc				2112
Leu Gly Glu Lys Ala Ser Pro Ile Leu Thr Ala Phe Glu Asn Lys Thr				
690	695	700		
tta act gcg gaa aaa tta gct aac gcc atg aat ctt gat gct aat tta				2160
Leu Thr Ala Glu Lys Leu Ala Asn Ala Met Asn Leu Asp Ala Asn Leu				
705	710	715	720	
ctg gaa caa gcc agt att caa gca caa aat tat aag cag gtt act aaa				2208
Leu Glu Gln Ala Ser Ile Gln Ala Gln Asn Tyr Lys Gln Val Thr Lys				
725	730	735		
gaa aat aca ttc tcc aat tgg caa tcc atc gac att att ctg caa tgg				2256
Glu Asn Thr Phe Ser Asn Trp Gln Ser Ile Asp Ile Ile Leu Gln Trp				
740	745	750		
act aat ata gcc agt aat tta aat atc tcc cca caa ggt att tcc cct				2304
Thr Asn Ile Ala Ser Asn Leu Asn Ile Ser Pro Gln Gly Ile Ser Pro				
755	760	765		
cta ata gca ttg gat tat ata aaa ccg gct caa aaa aca ccg act tat				2352
Leu Ile Ala Leu Asp Tyr Ile Lys Pro Ala Gln Lys Thr Pro Thr Tyr				
770	775	780		
gcc caa tgg gaa aat gca gct ata gca tta act gcc ggg tta gac act				2400
Ala Gln Trp Glu Asn Ala Ala Ile Ala Leu Thr Ala Gly Leu Asp Thr				
785	790	795	800	
caa caa act cat act cta cac gta ttt ctg gac gaa tct cgc agt acc				2448

Gln	Gln	Thr	His	Thr	Leu	His	Val	Phe	Leu	Asp	Glu	Ser	Arg	Ser	Thr	
805									810						815	
gca tta agc aac tat tat att ggc aag gtt gct aat cgg gca gca tca															2496	
Ala	Leu	Ser	Asn	Tyr	Tyr	Ile	Gly	Lys	Val	Ala	Asn	Arg	Ala	Ala	Ser	
820									825						830	
att aaa agc cgt gac gat tta tac caa tac tta ctg att gat aat caa															2544	
Ile	Lys	Ser	Arg	Asp	Asp	Leu	Tyr	Gln	Tyr	Leu	Ile	Asp	Asn	Gln		
835									840						845	
gtt tcc gct gaa ata aaa act aca cgt att gcc gaa gcc att gcc agt															2592	
Val	Ser	Ala	Glu	Ile	Lys	Thr	Thr	Arg	Ile	Ala	Glu	Ala	Ile	Ala	Ser	
850									855						860	
atc caa ttg tat gtc aac cga gcg ctg gaa aat ata gaa atc cat gcc															2640	
Ile	Gln	Leu	Tyr	Val	Asn	Arg	Ala	Leu	Glu	Asn	Ile	Glu	Ile	His	Ala	
865									870						880	
gtt tct gat gtt att acc cgt caa ttt ttt atc gat tgg gat aaa tat															2688	
Val	Ser	Asp	Val	Ile	Thr	Arg	Gln	Phe	Phe	Ile	Asp	Trp	Asp	Lys	Tyr	
885									890						895	
aat aaa cgt tac agt act tgg gct ggc gtt tca caa tta gtt tac tat															2736	
Asn	Lys	Arg	Tyr	Ser	Thr	Trp	Ala	Gly	Val	Ser	Gln	Leu	Val	Tyr	Tyr	
900									905						910	
ccc gaa aat tat atc gac ccg acg atg cgt atc gga caa acg aaa atg															2784	
Pro	Glu	Asn	Tyr	Ile	Asp	Pro	Thr	Met	Arg	Ile	Gly	Gln	Thr	Lys	Met	
915									920						925	
atg gat acg tta ttg caa tcc gtc agc cag agc caa tta aat gcc gat															2832	
Met	Asp	Thr	Leu	Leu	Gln	Ser	Val	Ser	Gln	Ser	Gln	Leu	Asn	Ala	Asp	
930									935						940	
acg gta gaa gat gca ttt aaa tct tac ctg acc tcg ttt gaa caa gtc															2880	
Thr	Val	Glu	Asp	Ala	Phe	Lys	Ser	Tyr	Leu	Thr	Ser	Phe	Glu	Gln	Val	
945									950						955	
gct aat ttg gaa gtc att agt gct tat cat gat aac gtt aat aat gac															2928	
Ala	Asn	Leu	Glu	Val	Ile	Ser	Ala	Tyr	His	Asp	Asn	Val	Asn	Asn	Asp	
965									970						975	
caa gga ctg acc tat ttt atc ggg aac agc aaa aca gaa gtt aat caa															2976	
Gln	Gly	Leu	Thr	Tyr	Phe	Ile	Gly	Asn	Ser	Lys	Thr	Glu	Val	Asn	Gln	
980									985						990	
tat tac tgg cgc agc gtc gat cac agt aaa ttc aac gac ggt aaa ttc															3024	
Tyr	Tyr	Trp	Arg	Ser	Val	Asp	His	Ser	Lys	Phe	Asn	Asp	Gly	Lys	Phe	
995									1000						1005	
gct gct aat gcc tgg agt gaa tgg cac aaa att gac tgc gca att															3069	
Ala	Ala	Asn	Ala	Trp	Ser	Glu	Trp	His	Lys	Ile	Asp	Cys	Ala	Ile		
1010									1015						1020	
aat ccc tac caa agc acc att cgc cca gtt atc tat aaa tcc cga															3114	
Asn	Pro	Tyr	Gln	Ser	Thr	Ile	Arg	Pro	Val	Ile	Tyr	Lys	Ser	Arg		
1025									1030						1035	
tta tat ctg att tgg ctg gaa caa aaa gaa aca gct aaa caa aag															3159	
Leu	Tyr	Leu	Ile	Trp	Leu	Glu	Gln	Lys	Glu	Thr	Ala	Lys	Gln	Lys		
1040									1045						1050	
gag gat aat aaa gtc act aca gac tat cac tat gaa tta aaa ttg															3204	

Glu	Asp	Asn	Lys	Val	Thr	Thr	Asp	Tyr	His	Tyr	Glu	Leu	Lys	Leu	
1055					1060						1065				
gct	cat	att	cgt	tat	gat	ggt	acc	tgg	aat	gtg	cca	atc	acc	ttt	3249
Ala	His	Ile	Arg	Tyr	Asp	Gly	Thr	Trp	Asn	Val	Pro	Ile	Thr	Phe	
1070						1075					1080				
gat	gta	gat	gaa	aaa	ata	cta	gct	tta	gaa	ctg	aca	aaa	tct	caa	3294
Asp	Val	Asp	Glu	Lys	Ile	Leu	Ala	Leu	Glu	Leu	Thr	Lys	Ser	Gln	
1085						1090					1095				
gca	cct	gga	ctc	tat	tgc	gca	ggt	tat	caa	ggg	gaa	gat	aca	cta	3339
Ala	Pro	Gly	Leu	Tyr	Cys	Ala	Gly	Tyr	Gln	Gly	Glu	Asp	Thr	Leu	
1100						1105					1110				
tta	atc	atg	ttt	tat	aga	aaa	aaa	gag	aaa	ttg	gat	gat	tat	aaa	3384
Leu	Ile	Met	Phe	Tyr	Arg	Lys	Lys	Glu	Lys	Leu	Asp	Asp	Tyr	Lys	
1115						1120					1125				
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Thr	Ala	Pro	Met	Gln	Gly	Phe	Tyr	Ile	Phe	Ser	Asp	Met	Ser	Ser	
1130						1135					1140				
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Ser Leu Tyr Arg Leu Leu His Ile Ala Asn His Asn Asn Thr Asp Gly		
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 Ser Glu Asn Lys Ile Thr Ala Glu Lys Phe Trp Ile Trp Leu Gln Asn
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 Ser Gly Ile Asn Glu Asn Ala Phe Arg Leu Phe Ile Glu Lys Pro Thr
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 Ile Phe Gly Ile Pro Asp Glu Pro Asn Lys Ala Thr Pro Ala His Asn
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Lys	Gln	Tyr	Ile	Tyr	Met	Thr	Asp	Ser	Lys	Gly	Thr	Ala	Thr	Asp
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Asn	Lys	Asp	Val	Ser	Val	Gln	Pro	Ser	Pro	Ser	Phe	Glu	Glu	Met
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Cys	Tyr	Gln	Phe	Asn	Ala	Leu	Glu	Ile	Asp	Gly	Ser	Asn	Leu	Asn
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Phe	Thr	Asn	Asn	Ser	Ala	Ser	Ile	Asp	Val	Thr	Phe	Thr	Ala	Leu
1415						1420					1425			
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1430						1435					1440			

Val	Ile	Gln	Lys	Val	Lys	Thr	Asp	Asn	Ala	Leu	Thr	Leu	Phe	His
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Ala Tyr Arg Trp Glu Thr	Asn Asp Ser Ser Ala	Arg Phe Ile Lys
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Pro Gly Ala Trp Gln Gly	Thr Tyr Ala Gly Leu	Leu Ala Gly Glu
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Thr Leu Met Leu Asn Leu	Ala Gln Met Glu Asp	Ala His Leu Lys
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Glu Met Gln Leu Gly Lys	Thr Arg Arg Ile Lys	Gln Ile Ser Val
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Ser Leu Pro Ala Leu Leu	Gly Pro Tyr Gln Asp	Val Gln Ala Val
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Ile Asn Asp Lys Gly Thr	Phe Thr Leu Ser Phe	Pro Pro Asn Ala Ala
2345	2350	2355
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 Pro Asp Gly Met Ala Ala Leu Ser Leu Pro Leu Pro Ile Ser Ala Gly
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 Arg Gly Tyr Ala Pro Ala Phe Thr Leu Asn Tyr Asn Ser Gly Ala Gly
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 Arg Arg Thr His Phe Gly Val Pro His Tyr Asp Glu Thr Asp Thr Phe
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 Leu Gly Pro Glu Gly Glu Val Leu Val Val Ala Asp Gln Pro Arg Asp
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 Glu Ser Thr Leu Gln Gly Ile Asn Leu Gly Ala Thr Phe Thr Val Thr
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 Gly Tyr Arg Ser Arg Leu Glu Ser His Phe Ser Arg Leu Glu Tyr Trp
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 Gln Pro Lys Thr Thr Gly Lys Thr Asp Phe Trp Leu Ile Tyr Ser Pro
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Ser Asn Ala Ser Leu Val Asp Ile Asn Gly Asp Gly Gln Leu Asp Trp	
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Asp Leu Val Leu Ile Gly Pro Lys Ser Val Arg Leu Tyr Ala Asn Thr		
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Arg Asp Gly Phe Ala Lys Gly Lys Asp Val Val Gln Ser Gly Asp Ile		
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Thr Leu Pro Val Pro Gly Ala Asp Pro Arg Lys Leu Val Ala Phe Ser		
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Asp Val Leu Gly Ser Gly Gln Ala His Leu Val Glu Val Ser Ala Thr		
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Lys Val Thr Cys Trp Pro Asn Leu Gly Arg Gly Arg Phe Gly Gln Pro		
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Ile Thr Leu Pro Gly Phe Ser Gln Pro Ala Thr Glu Phe Asn Pro Ala		
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Gln Val Tyr Leu Ala Asp Leu Asp Gly Ser Gly Pro Thr Asp Leu Ile		
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Tyr Val His Thr Asn Arg Leu Asp Ile Phe Leu Asn Lys Ser Gly Asn		
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Gly Phe Ala Glu Pro Val Thr Leu Arg Phe Pro Glu Gly Leu Arg Phe		
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Asp His Thr Cys Gln Leu Gln Met Ala Asp Val Gln Gly Leu Gly Val		
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Ala Ser Leu Ile Leu Ser Val Pro His Met Ser Pro His His Trp Arg		
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Cys Asp Leu Thr Asn Met Lys Pro Trp Leu Leu Asn Glu Met Asn Asn		
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Asn Met Gly Val His His Thr Leu Arg Tyr Arg Ser Ser Ser Gln Phe		
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ccg tta aca ccg gaa gat gat aac agt cgt tac tgg ttc aac ccg gcg Pro Leu Thr Pro Glu Asp Asp Asn Ser Arg Tyr Trp Phe Asn Arg Ala 850 855 860	2592
ttg aaa ggt caa ctg cta cgt agt gaa ctg tac gga ttg gac gat agt Leu Lys Gly Gln Leu Leu Arg Ser Glu Leu Tyr Gly Leu Asp Asp Ser 865 870 875 880	2640
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Ala	Gln	Cys	Gln	Val	Tyr	Ala	Pro	Glu	Ser	Trp	Met	Pro	Val	Leu	
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Val Tyr Asp Asn Arg Gly Leu Ile Ile Arg Asn Ile Asp Phe His Arg	20	25	30
act acc gca aat ggt gat ccc gat acc cgt att acc cgc cat caa tac			144
Thr Thr Ala Asn Gly Asp Pro Asp Thr Arg Ile Thr Arg His Gln Tyr	35	40	45
gat att cac gga cac cta aat caa agc atc gat ccg cgc cta tat gaa			192
Asp Ile His His Leu Asn Gln Ser Ile Asp Pro Arg Leu Tyr Glu	50	55	60
gcc aag caa acc aac aat acg atc aaa ccc aat ttt ctt tgg cag tat			240
Ala Lys Gln Thr Asn Asn Thr Ile Lys Pro Asn Phe Leu Trp Gln Tyr	65	70	75 80
gat ttg acc ggt aat ccc cta tgt aca gag agc att gat gca ggt cgc			288
Asp Leu Thr Gly Asn Pro Leu Cys Thr Glu Ser Ile Asp Ala Gly Arg	85	90	95
act gtc acc ttg aat gat att gaa ggc cgt ccg cta cta acg gtg act			336
Thr Val Thr Leu Asn Asp Ile Glu Gly Arg Pro Leu Leu Thr Val Thr	100	105	110
gca aca ggg gtt ata caa act cga caa tat gaa act tct tcc ctg ccc			384
Ala Thr Gly Val Ile Gln Thr Arg Gln Tyr Glu Thr Ser Ser Leu Pro	115	120	125
ggc cgt ctg tta tct gtt gcc gaa caa aca ccc gag gaa aaa aca tcc			432
Gly Arg Leu Leu Ser Val Ala Glu Gln Thr Pro Glu Glu Lys Thr Ser	130	135	140
cgt atc acc gaa cgc ctg att tgg gct ggc aat acc gaa gca gag aaa			480
Arg Ile Thr Glu Arg Leu Ile Trp Ala Gly Asn Thr Glu Ala Glu Lys	145	150	155 160
gac cat aac ctt gcc ggc cag tgc gtg cgt cac tat gac acg gcg gga			528
Asp His Asn Leu Ala Gly Gln Cys Val Arg His Tyr Asp Thr Ala Gly	165	170	175
gtt acc cgg tta gag agt tta tca ctg acc ggt act gtt tta tct caa			576
Val Thr Arg Leu Glu Ser Leu Ser Leu Thr Gly Thr Val Leu Ser Gln	180	185	190
tcc agc caa cta ttg atc gac act caa gag gca aac tgg aca ggt gat			624
Ser Ser Gln Leu Leu Ile Asp Thr Gln Glu Ala Asn Trp Thr Gly Asp	195	200	205
aac gaa acc gtc tgg caa aac atg ctg gct gat gac atc tac aca acc			672
Asn Glu Thr Val Trp Gln Asn Met Leu Ala Asp Asp Ile Tyr Thr Thr	210	215	220
ctg agc acc ttc gat gcc acc ggt gct tta ctg act cag acc gat gcg			720
Leu Ser Thr Phe Asp Ala Thr Gly Ala Leu Leu Thr Gln Thr Asp Ala	225	230	235 240
aaa ggg aac att cag aga ctg gct tat gat gtg gcc ggg cag cta aac			768
Lys Gly Asn Ile Gln Arg Leu Ala Tyr Asp Val Ala Gly Gln Leu Asn	245	250	255
ggg agc tgg cta aca ctc aaa ggc cag acg gaa caa gtg att atc aaa			816

Gly Ser Trp Leu Thr Leu Lys Gly Gln Thr Glu Gln Val Ile Ile Lys			
260	265	270	
tcc ctg acc tac tcc gcc gca caa aaa tta cgt gag gaa cac cgc ggc			864
Ser Leu Thr Tyr Ser Ala Ala Gly Gln Lys Leu Arg Glu Glu His Gly			
275	280	285	
aat gat gtt atc acc gaa tac agt tat gaa ccg gaa acc caa cgg ctt			912
Asn Asp Val Ile Thr Glu Tyr Ser Tyr Glu Pro Glu Thr Gln Arg Leu			
290	295	300	
atc ggt atc aaa acc cgc cgt ccg tca gac act aaa gtg cta caa gac			960
Ile Gly Ile Lys Thr Arg Arg Pro Ser Asp Thr Lys Val Leu Gln Asp			
305	310	315	320
ctg cgc tat gaa tat gac ccg gta ggc aat gtc atc agc atc cgt aat			1008
Leu Arg Tyr Glu Tyr Asp Pro Val Gly Asn Val Ile Ser Ile Arg Asn			
325	330	335	
gac gcg gaa gcc acc cgc ttt tgg cac aat cag aaa gtg atg ccg gaa			1056
Asp Ala Glu Ala Thr Arg Phe Trp His Asn Gln Lys Val Met Pro Glu			
340	345	350	
aac act tat acc tac gat tcc ctg tat cag ctt atc agc gcc acc ggg			1104
Asn Thr Tyr Thr Tyr Asp Ser Leu Tyr Gln Leu Ile Ser Ala Thr Gly			
355	360	365	
cgc gaa atg gcg aat ata ggt caa caa agt cac caa ttt ccc tca ccc			1152
Arg Glu Met Ala Asn Ile Gly Gln Gln Ser His Gln Phe Pro Ser Pro			
370	375	380	
gct cta cct tct gat aac aac acc tat acc aac tat acc cgt act tat			1200
Ala Leu Pro Ser Asp Asn Asn Thr Tyr Thr Asn Tyr Thr Arg Thr Tyr			
385	390	395	400
act tat gac cgt ggc ggc aat ctg acc aaa atc cag cac agt tca ccg			1248
Thr Tyr Asp Arg Gly Gly Asn Leu Thr Lys Ile Gln His Ser Ser Pro			
405	410	415	
gcg acg caa aac aac tac acc acc aat atc acg gtt tca aat cgc agc			1296
Ala Thr Gln Asn Asn Tyr Thr Asn Ile Thr Val Ser Asn Arg Ser			
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aac cgc gca gta ctc agc aca ttg acc gaa gat ccg gcg caa gta gat			1344
Asn Arg Ala Val Leu Ser Thr Leu Thr Glu Asp Pro Ala Gln Val Asp			
435	440	445	
gct ttg ttt gat gca ggc gga cat cag aac acc ttg ata tca gga caa			1392
Ala Leu Phe Asp Ala Gly Gly His Gln Asn Thr Leu Ile Ser Gly Gln			
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Asn Leu Asn Trp Asn Thr Arg Gly Glu Leu Gln Gln Val Thr Leu Val			
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Lys Arg Asp Lys Gly Ala Asn Asp Asp Arg Glu Trp Tyr Arg Tyr Ser			
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ggt gac gga aga agg atg tta aaa atc aat gaa cag cag gcc agc aac			1536
Gly Asp Gly Arg Arg Met Leu Lys Ile Asn Glu Gln Gln Ala Ser Asn			
500	505	510	
aac gct caa aca caa cgt gtg act tat ttg ccg aac tta gaa ctt cgt			1584

Asn Ala Gln Thr Gln Arg Val Thr Tyr Leu Pro Asn Leu Glu Leu Arg			
515	520	525	
ctc aca caa aac agc acg gcc aca acc gaa gat ttg caa gtt atc acc			1632
Leu Thr Gln Asn Ser Thr Ala Thr Thr Glu Asp Leu Gln Val Ile Thr			
530	535	540	
gta ggc gaa gcg ggc cgf gca cag gta cga gta tta cat tgg gag agc			1680
Val Gly Glu Ala Gly Arg Ala Gln Val Arg Val Leu His Trp Glu Ser			
545	550	555	560
ggt aaa ccg gaa gat atc gac aat aat cag ttg cgt tat agt tac gat			1728
Gly Lys Pro Glu Asp Ile Asp Asn Asn Gln Leu Arg Tyr Ser Tyr Asp			
565	570	575	
aat ctt atc ggt tcc agt caa ctt gaa tta gat agc gaa gga caa att			1776
Asn Leu Ile Gly Ser Ser Gln Leu Glu Leu Asp Ser Glu Gly Gln Ile			
580	585	590	
atc agt gaa gaa gaa tat tat ccc tat ggt gga aca gca tta tgg gcc			1824
Ile Ser Glu Glu Tyr Tyr Pro Tyr Gly Gly Thr Ala Leu Trp Ala			
595	600	605	
gcc agg aat cag aca gaa gcc agt tat aaa act atc cgt tat tca ggc			1872
Ala Arg Asn Gln Thr Glu Ala Ser Tyr Lys Thr Ile Arg Tyr Ser Gly			
610	615	620	
aaa gag ccg gat gcc acc ggg cta tat tac tac ggc tat cgg tat tac			1920
Lys Glu Arg Asp Ala Thr Gly Leu Tyr Tyr Gly Tyr Arg Tyr Tyr			
625	630	635	640
caa ccg tgg ata gga ccg tgg tta agc tcc gat ccg gca gga aca atc			1968
Gln Pro Trp Ile Gly Arg Trp Leu Ser Ser Asp Pro Ala Gly Thr Ile			
645	650	655	
gat ggg ctg aat tta tat ccg atg gtg agg aat aat cca gtt acc ctc			2016
Asp Gly Leu Asn Leu Tyr Arg Met Val Arg Asn Asn Pro Val Thr Leu			
660	665	670	
ctt gat cct gat gga tta atg cca aca att gca gaa cgc ata gca gca			2064
Leu Asp Pro Asp Gly Leu Met Pro Thr Ile Ala Glu Arg Ile Ala Ala			
675	680	685	
cta aaa aaa aat aaa gta aca gac tca gcg cct tcg cca gca aat gcc			2112
Leu Lys Lys Asn Lys Val Thr Asp Ser Ala Pro Ser Pro Ala Asn Ala			
690	695	700	
aca aac gta gcg ata aac atc cgc ccg cct gta gca cca aaa cct agc			2160
Thr Asn Val Ala Ile Asn Ile Arg Pro Pro Val Ala Pro Lys Pro Ser			
705	710	715	720
tta ccg aaa gca tca acg agt agc caa cca acc aca cac cct atc gga			2208
Leu Pro Lys Ala Ser Thr Ser Ser Gln Pro Thr Thr His Pro Ile Gly			
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gct gca aac ata aaa cca acg acg tct ggg tca tct att gtt gct cca			2256
Ala Ala Asn Ile Lys Pro Thr Thr Ser Gly Ser Ser Ile Val Ala Pro			
740	745	750	
ttg agt cca gta gga aat aaa tct act tct gaa atc tct ctg cca gaa			2304
Leu Ser Pro Val Gly Asn Lys Ser Thr Ser Glu Ile Ser Leu Pro Glu			
755	760	765	
agc gct caa agc agt tct tca agc act acc tcg aca aat cta cag aaa			2352

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Lys	Ser	Phe	Thr	Leu	Tyr	Arg	Ala	Asp	Asn	Arg	Ser	Phe	Glu	Glu	Met		
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caa	agt	aaa	ttc	cct	gaa	gga	ttt	aaa	gcc	tgg	act	cct	cta	gac	act		2448
Gln	Ser	Lys	Phe	Pro	Glu	Gly	Phe	Lys	Ala	Trp	Thr	Pro	Leu	Asp	Thr		
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Lys	Pro	Lys	Leu	Lys	Asp	Leu	Ser	Asn	Tyr	Ile	Lys	Tyr	Thr	Lys	Asp		
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Lys	Ser	Thr	Val	Trp	Val	Ser	Thr	Ala	Ile	Asn	Thr	Glu	Ala	Gly	Gly		
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Gln	Ser	Ser	Gly	Ala	Pro	Leu	His	Lys	Ile	Asp	Met	Asp	Leu	Tyr	Glu		
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ttt	gcc	att	gat	gga	caa	aaa	cta	aat	cca	cta	ccg	gag	ggt	aga	act		2736
Phe	Ala	Ile	Asp	Gly	Gln	Lys	Leu	Asn	Pro	Leu	Pro	Glu	Gly	Arg	Thr		
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aaa	aac	atg	gta	cct	tcc	ctt	tta	ctc	gac	acc	cca	caa	ata	gag	aca		2784
Lys	Asn	Met	Val	Pro	Ser	Leu	Leu	Leu	Asp	Thr	Pro	Gln	Ile	Glu	Thr		
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tca	tcc	atc	att	gca	ctt	aat	cat	gga	ccg	gta	aat	gat	gca	gaa	att		2832
Ser	Ser	Ile	Ile	Ala	Leu	Asn	His	Gly	Pro	Val	Asn	Asp	Ala	Glu	Ile		
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Val	Tyr	Asp	Asn	Arg	Gly	Leu	Ile	Ile	Arg	Asn	Ile	Asp	Phe	His	Arg		
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Thr Thr Ala Asn Gly Asp Pro Asp Thr Arg Ile Thr Arg His Gln Tyr
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 Asp Ile His Gly His Leu Asn Gln Ser Ile Asp Pro Arg Leu Tyr Glu
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 Asp Leu Thr Gly Asn Pro Leu Cys Thr Glu Ser Ile Asp Ala Gly Arg
 85 90 95
 Thr Val Thr Leu Asn Asp Ile Glu Gly Arg Pro Leu Leu Thr Val Thr
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 Ala Thr Gly Val Ile Gln Thr Arg Gln Tyr Glu Thr Ser Ser Leu Pro
 115 120 125
 Gly Arg Leu Leu Ser Val Ala Glu Gln Thr Pro Glu Glu Lys Thr Ser
 130 135 140
 Arg Ile Thr Glu Arg Leu Ile Trp Ala Gly Asn Thr Glu Ala Glu Lys
 145 150 155 160
 Asp His Asn Leu Ala Gly Gln Cys Val Arg His Tyr Asp Thr Ala Gly
 165 170 175
 Val Thr Arg Leu Glu Ser Leu Ser Leu Thr Gly Thr Val Leu Ser Gln
 180 185 190
 Ser Ser Gln Leu Leu Ile Asp Thr Gln Glu Ala Asn Trp Thr Gly Asp
 195 200 205
 Asn Glu Thr Val Trp Gln Asn Met Leu Ala Asp Asp Ile Tyr Thr Thr
 210 215 220
 Leu Ser Thr Phe Asp Ala Thr Gly Ala Leu Leu Thr Gln Thr Asp Ala
 225 230 235 240
 Lys Gly Asn Ile Gln Arg Leu Ala Tyr Asp Val Ala Gly Gln Leu Asn
 245 250 255
 Gly Ser Trp Leu Thr Leu Lys Gly Gln Thr Glu Gln Val Ile Ile Lys
 260 265 270
 Ser Leu Thr Tyr Ser Ala Ala Gly Gln Lys Leu Arg Glu Glu His Gly
 275 280 285
 Asn Asp Val Ile Thr Glu Tyr Ser Tyr Glu Pro Glu Thr Gln Arg Leu
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 Ile Gly Ile Lys Thr Arg Arg Pro Ser Asp Thr Lys Val Leu Gln Asp
 305 310 315 320
 Leu Arg Tyr Glu Tyr Asp Pro Val Gly Asn Val Ile Ser Ile Arg Asn
 325 330 335
 Asp Ala Glu Ala Thr Arg Phe Trp His Asn Gln Lys Val Met Pro Glu
 340 345 350
 Asn Thr Tyr Thr Tyr Asp Ser Leu Tyr Gln Leu Ile Ser Ala Thr Gly
 355 360 365

Arg Glu Met Ala Asn Ile Gly Gln Gln Ser His Gln Phe Pro Ser Pro
 370 375 380
 Ala Leu Pro Ser Asp Asn Asn Thr Tyr Thr Asn Tyr Thr Arg Thr Tyr
 385 390 395 400
 Thr Tyr Asp Arg Gly Gly Asn Leu Thr Lys Ile Gln His Ser Ser Pro
 405 410 415
 Ala Thr Gln Asn Asn Tyr Thr Asn Ile Thr Val Ser Asn Arg Ser
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 Asn Arg Ala Val Leu Ser Thr Leu Thr Glu Asp Pro Ala Gln Val Asp
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 Ala Leu Phe Asp Ala Gly Gly His Gln Asn Thr Leu Ile Ser Gly Gln
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 Asn Leu Asn Trp Asn Thr Arg Gly Glu Leu Gln Gln Val Thr Leu Val
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 Lys Arg Asp Lys Gly Ala Asn Asp Asp Arg Glu Trp Tyr Arg Tyr Ser
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 Gly Asp Gly Arg Arg Met Leu Lys Ile Asn Glu Gln Gln Ala Ser Asn
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 Val Gly Glu Ala Gly Arg Ala Gln Val Arg Val Leu His Trp Glu Ser
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 Gly Lys Pro Glu Asp Ile Asp Asn Asn Gln Leu Arg Tyr Ser Tyr Asp
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 Asn Leu Ile Gly Ser Ser Gln Leu Glu Leu Asp Ser Glu Gly Gln Ile
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 Ile Ser Glu Glu Glu Tyr Tyr Pro Tyr Gly Gly Thr Ala Leu Trp Ala
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 Ala Arg Asn Gln Thr Glu Ala Ser Tyr Lys Thr Ile Arg Tyr Ser Gly
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 Lys Glu Arg Asp Ala Thr Gly Leu Tyr Tyr Tyr Gly Tyr Arg Tyr Tyr
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 Gln Pro Trp Ile Gly Arg Trp Leu Ser Ser Asp Pro Ala Gly Thr Ile
 645 650 655
 Asp Gly Leu Asn Leu Tyr Arg Met Val Arg Asn Asn Pro Val Thr Leu
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 Leu Asp Pro Asp Gly Leu Met Pro Thr Ile Ala Glu Arg Ile Ala Ala
 675 680 685
 Leu Lys Lys Asn Lys Val Thr Asp Ser Ala Pro Ser Pro Ala Asn Ala
 690 695 700
 Thr Asn Val Ala Ile Asn Ile Arg Pro Pro Val Ala Pro Lys Pro Ser

705	710	715	720
Leu Pro Lys Ala Ser Thr Ser Ser Gln Pro Thr Thr His Pro Ile Gly			
725	730	735	
Ala Ala Asn Ile Lys Pro Thr Thr Ser Gly Ser Ser Ile Val Ala Pro			
740	745	750	
Leu Ser Pro Val Gly Asn Lys Ser Thr Ser Glu Ile Ser Leu Pro Glu			
755	760	765	
Ser Ala Gln Ser Ser Ser Ser Ser Thr Thr Ser Thr Asn Leu Gln Lys			
770	775	780	
Lys Ser Phe Thr Leu Tyr Arg Ala Asp Asn Arg Ser Phe Glu Glu Met			
785	790	795	800
Gln Ser Lys Phe Pro Glu Gly Phe Lys Ala Trp Thr Pro Leu Asp Thr			
805	810	815	
Lys Met Ala Arg Gln Phe Ala Ser Ile Phe Ile Gly Gln Lys Asp Thr			
820	825	830	
Ser Asn Leu Pro Lys Glu Thr Val Lys Asn Ile Ser Thr Trp Gly Ala			
835	840	845	
Lys Pro Lys Leu Lys Asp Leu Ser Asn Tyr Ile Lys Tyr Thr Lys Asp			
850	855	860	
Lys Ser Thr Val Trp Val Ser Thr Ala Ile Asn Thr Glu Ala Gly Gly			
865	870	875	880
Gln Ser Ser Gly Ala Pro Leu His Lys Ile Asp Met Asp Leu Tyr Glu			
885	890	895	
Phe Ala Ile Asp Gly Gln Lys Leu Asn Pro Leu Pro Glu Gly Arg Thr			
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Lys Asn Met Val Pro Ser Leu Leu Leu Asp Thr Pro Gln Ile Glu Thr			
915	920	925	
Ser Ser Ile Ile Ala Leu Asn His Gly Pro Val Asn Asp Ala Glu Ile			
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gtc tac gat aac cgt ggc ctg acc att cgt aac atc gac ttt cac cgt				96
Val Tyr Asp Asn Arg Gly Leu Thr Ile Arg Asn Ile Asp Phe His Arg				
20	25		30	
gac gtc gcg gga ggc gat aca gat act cgt att acc cgc cac caa tat				144
Asp Val Ala Gly Gly Asp Thr Asp Thr Arg Ile Thr Arg His Gln Tyr				
35	40		45	
gat acc cga gga cac ttg agc caa agc att gat cca cgg ctg tat gac				192
Asp Thr Arg Gly His Leu Ser Gln Ser Ile Asp Pro Arg Leu Tyr Asp				
50	55		60	
gcc aaa caa acc aat aac tcg aca aac ccc aac ttc ctc tgg caa tac				240
Ala Lys Gln Thr Asn Asn Ser Thr Asn Pro Asn Phe Leu Trp Gln Tyr				
65	70	75	80	
aat ctc acc ggc gac act ttg cgg aca gaa agt gtc gat gcc ggc cgt				288
Asn Leu Thr Gly Asp Thr Leu Arg Thr Glu Ser Val Asp Ala Gly Arg				
85	90		95	
acc gta gcc ctc aat gat att gaa ggc cgt caa gtg ttg att gta acc				336
Thr Val Ala Leu Asn Asp Ile Glu Gly Arg Gln Val Leu Ile Val Thr				
100	105		110	
gca acc ggc gcc att cag acc cga caa tat gaa gcc aat acc ctg ccc				384
Ala Thr Gly Ala Ile Gln Thr Arg Gln Tyr Glu Ala Asn Thr Leu Pro				
115	120		125	
ggt cgt cta tta tcc gta agt gaa caa gcc ccc gga gaa cag act ccc				432
Gly Arg Leu Leu Ser Val Ser Glu Gln Ala Pro Gly Glu Gln Thr Pro				
130	135		140	
cgc gtt act gag cat ttt att tgg gct ggt aat aca cag gcg gag aaa				480
Arg Val Thr Glu His Phe Ile Trp Ala Gly Asn Thr Gln Ala Glu Lys				
145	150	155	160	
gat cat aat ctt gcc ggc cag tat gtg cgc cac tac gac aca gca gga				528
Asp His Asn Leu Ala Gly Gln Tyr Val Arg His Tyr Asp Thr Ala Gly				
165	170		175	
gtg acg caa ctg gaa agc ctg tca ttg aca gaa aac atc tta tct caa				576
Val Thr Gln Leu Glu Ser Leu Ser Leu Thr Glu Asn Ile Leu Ser Gln				
180	185		190	
tcc cgt cag tta tta gcc gac ggt cag gaa gca gac tgg aca ggt aac				624
Ser Arg Gln Leu Leu Ala Asp Gly Gln Glu Ala Asp Trp Thr Gly Asn				
195	200		205	
gat gaa acc ctc tgg cag acc aaa ctc aat agc gaa act tac acg aca				672
Asp Glu Thr Leu Trp Gln Thr Lys Leu Asn Ser Glu Thr Tyr Thr Thr				
210	215		220	
caa agc acc ttt gat gct acc ggc gct ttg ctg acc caa acc gat gca				720
Gln Ser Thr Phe Asp Ala Thr Gly Ala Leu Leu Thr Gln Thr Asp Ala				
225	230		235	240
aaa ggc aac atg caa cgt ctg gct tac aac gtc gca gga caa tta caa				768
Lys Gly Asn Met Gln Arg Leu Ala Tyr Asn Val Ala Gly Gln Leu Gln				
245	250		255	
ggt agc tgg ctg aca ttg aaa aac caa agt gag caa gtc att gtc aaa				816
Gly Ser Trp Leu Thr Leu Lys Asn Gln Ser Glu Gln Val Ile Val Lys				

	260	265	270	
tcc ctg acc tat tcc gcc gca ggc cag aaa ttg cgt gaa gaa cac ggt Ser Leu Thr Tyr Ser Ala Ala Gly Gln Lys Leu Arg Glu Glu His Gly	275	280	285	864
aat ggc gtt atc act gaa tac agc tat gaa ccg gaa act cta cga ttg Asn Gly Val Ile Thr Glu Tyr Ser Tyr Glu Pro Glu Thr Leu Arg Leu	290	295	300	912
atc ggt acc act act cgc cgt caa tca gat agc aag gtg tta caa gat Ile Gly Thr Thr Arg Arg Gln Ser Asp Ser Lys Val Leu Gln Asp	305	310	315	960
cta cgc tat gaa cat gat cct gta ggg aat att att agt gtc cgt aat Leu Arg Tyr Glu His Asp Pro Val Gly Asn Ile Ile Ser Val Arg Asn	325	330	335	1008
gat gca gaa gcc acc cgc ttc tgg cgc aat cag aaa ata gtc cct gaa Asp Ala Glu Ala Thr Arg Phe Trp Arg Asn Gln Lys Ile Val Pro Glu	340	345	350	1056
aat acc tac acc tac gat tcc ctg tat cag ctt atc agt gca aca gga Asn Thr Tyr Thr Tyr Asp Ser Leu Tyr Gln Leu Ile Ser Ala Thr Gly	355	360	365	1104
cgt gag atg gct aac atc ggc cag caa agc aac caa ctt cct tcg cca Arg Glu Met Ala Asn Ile Gly Gln Gln Ser Asn Gln Leu Pro Ser Pro	370	375	380	1152
atc atc cct ctt cct act gat gaa aac tca tat acc aac tat act cgc Ile Ile Pro Leu Pro Thr Asp Glu Asn Ser Tyr Thr Asn Tyr Thr Arg	385	390	395	400
agc tat aat tac gat cgc ggc aat ttg gtt caa atc cgg cac agt Ser Tyr Asn Tyr Asp Arg Gly Gly Asn Leu Val Gln Ile Arg His Ser	405	410	415	1248
tcc ccc gcc caa aat aac tac acc aca gat atc acc gtt tcg aat Ser Pro Ala Ala Gln Asn Asn Tyr Thr Asp Ile Thr Val Ser Asn	420	425	430	1296
cgc agt aac cgg gca gtg ctg agt tcg cta acc tca gac cca aca cag Arg Ser Asn Arg Ala Val Leu Ser Ser Leu Thr Ser Asp Pro Thr Gln	435	440	445	1344
gtg gag gca ctg ttt gat gcc ggc gga cat caa aca aaa ttg tta ccg Val Glu Ala Leu Phe Asp Ala Gly Gly His Gln Thr Lys Leu Leu Pro	450	455	460	1392
ggg caa gag ctg agt tgg aat aca cga ggt gaa cta aaa cag gta acg Gly Gln Glu Leu Ser Trp Asn Thr Arg Gly Glu Leu Lys Gln Val Thr	465	470	475	1440
cca gtc agt cgc gag agc gcc agc gat cgg gaa tgg tat cgt tac ggc Pro Val Ser Arg Glu Ser Ala Ser Asp Arg Glu Trp Tyr Arg Tyr Gly	485	490	495	1488
aac gac ggc atg cga cgg tta aaa gtc agt gag caa cag act ggc aac Asn Asp Gly Met Arg Arg Leu Lys Val Ser Glu Gln Gln Thr Gly Asn	500	505	510	1536
agc acg cag cag caa cga gta act tat ctt ccc gat ctg gag cta cgt Ser Thr Gln Gln Arg Val Thr Tyr Leu Pro Asp Leu Glu Leu Arg				1584

515	520	525	
aca aca caa aat ggg act act aca tca gaa gac ctg cat gct att acc Thr Thr Gln Asn Gly Thr Thr Ser Glu Asp Leu His Ala Ile Thr 530	535	540	1632
gtg gga gca gca ggc cac gca caa gtg cga gtt cta cac tgg gaa act Val Gly Ala Ala Gly His Ala Gln Val Arg Val Leu His Trp Glu Thr 545	550	555	1680
acg cca cca gcc ggt atc aat aac aat cag ctt cgc tat agc tat gat Thr Pro Pro Ala Gly Ile Asn Asn Gln Leu Arg Tyr Ser Tyr Asp 565	570	575	1728
aat ttg att ggt tcc agt caa ctt gaa ctg gat aac gca gga caa att Asn Leu Ile Gly Ser Ser Gln Leu Glu Leu Asp Asn Ala Gly Gln Ile 580	585	590	1776
atc agt cag gaa gag tat tat cca ttt ggc ggc aca gca tta tgg gca Ile Ser Gln Glu Glu Tyr Tyr Pro Phe Gly Gly Thr Ala Leu Trp Ala 595	600	605	1824
gca aga aac caa ata gaa gcc agc tac aaa atc ctc cgt tac tca ggt Ala Arg Asn Gln Ile Glu Ala Ser Tyr Lys Ile Leu Arg Tyr Ser Gly 610	615	620	1872
aaa gaa cgc gat gct acc ggg ctc tat tat tac ggc tac cgc tat tat Lys Glu Arg Asp Ala Thr Gly Leu Tyr Tyr Gly Tyr Arg Tyr Tyr 625	630	635	1920
cag ccg tgg gtt ggt agg tgg tta agc gcc gat ccg gct gga aca atc Gln Pro Trp Val Gly Arg Trp Leu Ser Ala Asp Pro Ala Gly Thr Ile 645	650	655	1968
gat gga ctg aat cta tac cgg atg gtg aga aat aat ccg tca aca ctg Asp Gly Leu Asn Leu Tyr Arg Met Val Arg Asn Asn Pro Ser Thr Leu 660	665	670	2016
gtt gat att tct ggg ctt gca cct acg aaa tac aat att ccc gga ttt Val Asp Ile Ser Gly Leu Ala Pro Thr Lys Tyr Asn Ile Pro Gly Phe 675	680	685	2064
gac ttt gat gta gaa ata gat gag caa aaa aga tct aaa tta aaa cca Asp Phe Asp Val Glu Ile Asp Glu Gln Lys Arg Ser Lys Leu Lys Pro 690	695	700	2112
acg ttg ata aga atc aaa gat gaa ttt tta cat tat ggt cct gta gat Thr Leu Ile Arg Ile Lys Asp Glu Phe Leu His Tyr Gly Pro Val Asp 705	710	715	2160
aag ctg tta gaa gaa aaa aaa ccc ggc ctc aat gta cca gag gag cta Lys Leu Leu Glu Glu Lys Lys Pro Gly Leu Asn Val Pro Glu Glu Leu 725	730	735	2208
ttt gat aga ggt cca tcc gag aat gga gtg tca aca tta act ttc aaa Phe Asp Arg Gly Pro Ser Glu Asn Gly Val Ser Thr Leu Thr Phe Lys 740	745	750	2256
aaa gac cta ccg ata agt tgt att agc aac aca gaa tat acc ctt gat Lys Asp Leu Pro Ile Ser Cys Ile Ser Asn Thr Glu Tyr Thr Leu Asp 755	760	765	2304
atc tta tac aac aaa cat gag act aaa cca ttc cct tac gaa aac gaa Ile Leu Tyr Asn Lys His Glu Thr Lys Pro Phe Pro Tyr Glu Asn Glu			2352

770	775	780	
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aat aaa tca ata ggt aat gcc tct gac gaa gat tta aaa gaa gaa cat Asn Lys Ser Ile Gly Asn Ala Ser Asp Glu Asp Leu Lys Glu Glu His 805 810 815			2448
ctc cca tta gga aaa tcc aca atg gat aaa aca gac ctg cca gat tta Leu Pro Leu Gly Lys Ser Thr Met Asp Lys Thr Asp Leu Pro Asp Leu 820 825 830			2496
aaa caa ggg cta atg atc gcg gag aag ata aaa agt gga aaa ggg gca Lys Gln Gly Leu Met Ile Ala Glu Lys Ile Lys Ser Gly Lys Gly Ala 835 840 845			2544
tat cct ttt cat ttt ggt gct gca ata gct gtt gta tat ggt gag gat Tyr Pro Phe His Phe Gly Ala Ala Ile Ala Val Val Tyr Gly Glu Asp 850 855 860			2592
aaa aaa gta gcc gct tca att ctg aca gat tta tct gaa cct aaa aga Lys Lys Val Ala Ala Ser Ile Leu Thr Asp Leu Ser Glu Pro Lys Arg 865 870 875 880			2640
gac gaa ggc gag tat ttg caa agt acg aga aag gta agc gca atg ttt Asp Glu Gly Glu Tyr Leu Gln Ser Thr Arg Lys Val Ser Ala Met Phe 885 890 895			2688
atc aca aac gtc aat gaa ttt cgc ggc cat gat tac cca aaa agt aaa Ile Thr Asn Val Asn Glu Phe Arg Gly His Asp Tyr Pro Lys Ser Lys 900 905 910			2736
tat agt atc gga tta gtt aca gct gaa aaa cgt cag cca gta ata agc Tyr Ser Ile Gly Leu Val Thr Ala Glu Lys Arg Gln Pro Val Ile Ser 915 920 925			2784
aaa aaa cgt gca aac ccg gaa gag gcc cct tca tca tcc aga aat aaa Lys Lys Arg Ala Asn Pro Glu Glu Ala Pro Ser Ser Ser Arg Asn Lys 930 935 940			2832
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Val Tyr Asp Asn Arg Gly Leu Thr Ile Arg Asn Ile Asp Phe His Arg 20 25 30			
Asp Val Ala Gly Gly Asp Thr Asp Thr Arg Ile Thr Arg His Gln Tyr 35 40 45			

Asp Thr Arg Gly His Leu Ser Gln Ser Ile Asp Pro Arg Leu Tyr Asp
 50 55 60
 Ala Lys Gln Thr Asn Asn Ser Thr Asn Pro Asn Phe Leu Trp Gln Tyr
 65 70 75 80
 Asn Leu Thr Gly Asp Thr Leu Arg Thr Glu Ser Val Asp Ala Gly Arg
 85 90 95
 Thr Val Ala Leu Asn Asp Ile Glu Gly Arg Gln Val Leu Ile Val Thr
 100 105 110
 Ala Thr Gly Ala Ile Gln Thr Arg Gln Tyr Glu Ala Asn Thr Leu Pro
 115 120 125
 Gly Arg Leu Leu Ser Val Ser Glu Gln Ala Pro Gly Glu Gln Thr Pro
 130 135 140
 Arg Val Thr Glu His Phe Ile Trp Ala Gly Asn Thr Gln Ala Glu Lys
 145 150 155 160
 Asp His Asn Leu Ala Gly Gln Tyr Val Arg His Tyr Asp Thr Ala Gly
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 Val Thr Gln Leu Glu Ser Leu Ser Leu Thr Glu Asn Ile Leu Ser Gln
 180 185 190
 Ser Arg Gln Leu Leu Ala Asp Gly Gln Glu Ala Asp Trp Thr Gly Asn
 195 200 205
 Asp Glu Thr Leu Trp Gln Thr Lys Leu Asn Ser Glu Thr Tyr Thr Thr
 210 215 220
 Gln Ser Thr Phe Asp Ala Thr Gly Ala Leu Leu Thr Gln Thr Asp Ala
 225 230 235 240
 Lys Gly Asn Met Gln Arg Leu Ala Tyr Asn Val Ala Gly Gln Leu Gln
 245 250 255
 Gly Ser Trp Leu Thr Leu Lys Asn Gln Ser Glu Gln Val Ile Val Lys
 260 265 270
 Ser Leu Thr Tyr Ser Ala Ala Gly Gln Lys Leu Arg Glu Glu His Gly
 275 280 285
 Asn Gly Val Ile Thr Glu Tyr Ser Tyr Glu Pro Glu Thr Leu Arg Leu
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 Ile Gly Thr Thr Arg Arg Gln Ser Asp Ser Lys Val Leu Gln Asp
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 Leu Arg Tyr Glu His Asp Pro Val Gly Asn Ile Ile Ser Val Arg Asn
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 Asp Ala Glu Ala Thr Arg Phe Trp Arg Asn Gln Lys Ile Val Pro Glu
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 Asn Thr Tyr Thr Tyr Asp Ser Leu Tyr Gln Leu Ile Ser Ala Thr Gly
 355 360 365
 Arg Glu Met Ala Asn Ile Gly Gln Gln Ser Asn Gln Leu Pro Ser Pro
 370 375 380

Ile Ile Pro Leu Pro Thr Asp Glu Asn Ser Tyr Thr Asn Tyr Thr Arg
 385 390 395 400
 Ser Tyr Asn Tyr Asp Arg Gly Gly Asn Leu Val Gln Ile Arg His Ser
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 Ser Pro Ala Ala Gln Asn Asn Tyr Thr Thr Asp Ile Thr Val Ser Asn
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 Arg Ser Asn Arg Ala Val Leu Ser Ser Leu Thr Ser Asp Pro Thr Gln
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 Gly Gln Glu Leu Ser Trp Asn Thr Arg Gly Glu Leu Lys Gln Val Thr
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 Pro Val Ser Arg Glu Ser Ala Ser Asp Arg Glu Trp Tyr Arg Tyr Gly
 485 490 495
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 Ser Thr Gln Gln Gln Arg Val Thr Tyr Leu Pro Asp Leu Glu Leu Arg
 515 520 525
 Thr Thr Gln Asn Gly Thr Thr Ser Glu Asp Leu His Ala Ile Thr
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 Val Gly Ala Ala Gly His Ala Gln Val Arg Val Leu His Trp Glu Thr
 545 550 555 560
 Thr Pro Pro Ala Gly Ile Asn Asn Asn Gln Leu Arg Tyr Ser Tyr Asp
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 Asn Leu Ile Gly Ser Ser Gln Leu Glu Leu Asp Asn Ala Gly Gln Ile
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 Ile Ser Gln Glu Glu Tyr Tyr Pro Phe Gly Gly Thr Ala Leu Trp Ala
 595 600 605
 Ala Arg Asn Gln Ile Glu Ala Ser Tyr Lys Ile Leu Arg Tyr Ser Gly
 610 615 620
 Lys Glu Arg Asp Ala Thr Gly Leu Tyr Tyr Tyr Gly Tyr Arg Tyr Tyr
 625 630 635 640
 Gln Pro Trp Val Gly Arg Trp Leu Ser Ala Asp Pro Ala Gly Thr Ile
 645 650 655
 Asp Gly Leu Asn Leu Tyr Arg Met Val Arg Asn Asn Pro Ser Thr Leu
 660 665 670
 Val Asp Ile Ser Gly Leu Ala Pro Thr Lys Tyr Asn Ile Pro Gly Phe
 675 680 685
 Asp Phe Asp Val Glu Ile Asp Glu Gln Lys Arg Ser Lys Leu Lys Pro
 690 695 700
 Thr Leu Ile Arg Ile Lys Asp Glu Phe Leu His Tyr Gly Pro Val Asp
 705 710 715 720
 Lys Leu Leu Glu Glu Lys Lys Pro Gly Leu Asn Val Pro Glu Glu Leu

725	730	735
Phe Asp Arg Gly Pro Ser Glu Asn Gly Val Ser Thr Leu Thr Phe Lys 740 745 750		
Lys Asp Leu Pro Ile Ser Cys Ile Ser Asn Thr Glu Tyr Thr Leu Asp 755 760 765		
Ile Leu Tyr Asn Lys His Glu Thr Lys Pro Phe Pro Tyr Glu Asn Glu 770 775 780		
Ala Thr Val Gly Ala Asp Leu Gly Val Ile Met Ser Val Glu Phe Gly 785 790 795 800		
Asn Lys Ser Ile Gly Asn Ala Ser Asp Glu Asp Leu Lys Glu Glu His 805 810 815		
Leu Pro Leu Gly Lys Ser Thr Met Asp Lys Thr Asp Leu Pro Asp Leu 820 825 830		
Lys Gln Gly Leu Met Ile Ala Glu Lys Ile Lys Ser Gly Lys Gly Ala 835 840 845		
Tyr Pro Phe His Phe Gly Ala Ala Ile Ala Val Val Tyr Gly Glu Asp 850 855 860		
Lys Lys Val Ala Ala Ser Ile Leu Thr Asp Leu Ser Glu Pro Lys Arg 865 870 875 880		
Asp Glu Gly Glu Tyr Leu Gln Ser Thr Arg Lys Val Ser Ala Met Phe 885 890 895		
Ile Thr Asn Val Asn Glu Phe Arg Gly His Asp Tyr Pro Lys Ser Lys 900 905 910		
Tyr Ser Ile Gly Leu Val Thr Ala Glu Lys Arg Gln Pro Val Ile Ser 915 920 925		
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gtt cac gat aac cgt gga cta gct atc cgt aat att agt ttt cac cgc		96

Val His Asp Asn Arg Gly Leu Ala Ile Arg Asn Ile Ser Phe His Arg	20	25	30	
act acc gca gaa gca aat acc gat acc cgt att acc cgc cat caa tat				144
Thr Thr Ala Glu Ala Asn Thr Asp Thr Arg Ile Thr Arg His Gln Tyr				
35	40	45		
aat gcc ggc gga tat ttg aac caa agc att gat cct cgc ctg tat gac				192
Asn Ala Gly Gly Tyr Leu Asn Gln Ser Ile Asp Pro Arg Leu Tyr Asp				
50	55	60		
gcc aaa cag act aac aac gct gta caa ccg aat ttt atc tgg cga cat				240
Ala Lys Gln Thr Asn Asn Ala Val Gln Pro Asn Phe Ile Trp Arg His				
65	70	75	80	
aat ttg acc ggc aat atc ctg cga aca gag agc gtc gat gcc ggt cgg				288
Asn Leu Thr Gly Asn Ile Leu Arg Thr Glu Ser Val Asp Ala Gly Arg				
85	90	95		
acg att acc ctc aac gat att gaa ggc cgc ccg gtg ttg acc atc aat				336
Thr Ile Thr Leu Asn Asp Ile Glu Gly Arg Pro Val Leu Thr Ile Asn				
100	105	110		
gca gcc ggt gtc cgg caa aac cat cgc tac gaa gat aac acc ctg ccc				384
Ala Ala Gly Val Arg Gln Asn His Arg Tyr Glu Asp Asn Thr Leu Pro				
115	120	125		
ggt cgc ctg ctc gct atc agc gaa caa gga cag gca gaa gag aaa acg				432
Gly Arg Leu Leu Ala Ile Ser Glu Gln Gly Gln Ala Glu Glu Lys Thr				
130	135	140		
acc gag cgc ctt atc tgg gcc ggc aat acg ccg caa gaa aaa gac cac				480
Thr Glu Arg Leu Ile Trp Ala Gly Asn Thr Pro Gln Glu Lys Asp His				
145	150	155	160	
aac ctt gcc ggt cag tgc gtc cgc cat tac gat acc gca gga ctc act				528
Asn Leu Ala Gly Gln Cys Val Arg His Tyr Asp Thr Ala Gly Leu Thr				
165	170	175		
caa ctc aac agc ctt gcc ctg acc ggc gcc gtt cta tca caa tct caa				576
Gln Leu Asn Ser Leu Ala Leu Thr Gly Ala Val Leu Ser Gln Ser Gln				
180	185	190		
caa ctg ctt acc gat aac cag gat gcc gac tgg aca ggt gaa gac cag				624
Gln Leu Leu Thr Asp Asn Gln Asp Ala Asp Trp Thr Gly Glu Asp Gln				
195	200	205		
agc ctc tgg caa caa aaa ctg agt agt gat gtc tat atc acc caa agt				672
Ser Leu Trp Gln Gln Lys Leu Ser Ser Asp Val Tyr Ile Thr Gln Ser				
210	215	220		
aac act gat gcc acc ggg gct tta ctg acc cag acc gat gcc aaa ggc				720
Asn Thr Asp Ala Thr Gly Ala Leu Leu Thr Gln Thr Asp Ala Lys Gly				
225	230	235	240	
aac att cag cgg ctg gcc tat gat gtg gcc ggg cag cta aaa ggg agt				768
Asn Ile Gln Arg Leu Ala Tyr Asp Val Ala Gly Gln Leu Lys Gly Ser				
245	250	255		
tgg tta aca ctc aaa ggt cag gcg gaa cag gtg att atc aaa tcg cta				816
Trp Leu Thr Leu Lys Gly Gln Ala Glu Gln Val Ile Ile Lys Ser Leu				
260	265	270		
acc tac tcc gcc gcc ggg caa aaa tta cgt gaa gag cac ggt aac ggg				864

Thr	Tyr	Ser	Ala	Ala	Gly	Gln	Lys	Leu	Arg	Glu	Glu	His	Gly	Asn	Gly	
275							280					285				
att	gtc	act	gaa	tac	agc	tac	gaa	ccg	gaa	acc	caa	cg	ctt	atc	ggc	912
Ile	Val	Thr	Glu	Tyr	Ser	Tyr	Glu	Pro	Glu	Thr	Gln	Arg	Leu	Ile	Gly	
290			295				300									
att	acc	act	cgc	cgt	cca	tca	gac	gcc	aag	gtg	ttg	caa	gac	cta	cgc	960
Ile	Thr	Thr	Arg	Arg	Pro	Ser	Asp	Ala	Lys	Val	Leu	Gln	Asp	Leu	Arg	
305			310				315					320				
tat	caa	tat	gac	cca	gta	ggc	aat	gtc	att	agt	atc	cgt	aat	gat	gog	1008
Tyr	Gln	Tyr	Asp	Pro	Val	Gly	Asn	Val	Ile	Ser	Ile	Arg	Asn	Asp	Ala	
325			330			335										
gaa	gcc	act	cgc	ttt	tgg	cgc	aat	cag	aaa	gta	gcc	ccg	gag	aat	agc	1056
Glu	Ala	Thr	Arg	Phe	Trp	Arg	Asn	Gln	Lys	Val	Ala	Pro	Glu	Asn	Ser	
340			345			350										
tat	acc	acc	gat	tcc	ctg	tat	cag	ctt	atc	agc	gcc	acc	ggg	cgc	gag	1104
Tyr	Thr	Tyr	Asp	Ser	Leu	Tyr	Gln	Leu	Ile	Ser	Ala	Thr	Gly	Arg	Glu	
355			360			365										
atg	gcc	aat	atc	ggt	cag	caa	agc	aac	caa	ctt	ccc	tct	ccg	gct	cta	1152
Met	Ala	Asn	Ile	Gly	Gln	Gln	Ser	Asn	Gln	Leu	Pro	Ser	Pro	Ala	Leu	
370			375			380										
cct	tct	gat	aac	aat	acc	acc	aac	tat	act	cgc	act	tat	act	tat		1200
Pro	Ser	Asp	Asn	Asn	Thr	Tyr	Thr	Asn	Tyr	Thr	Arg	Thr	Tyr	Thr	Tyr	
385			390			395			400							
gac	cgt	ggc	ggc	aat	ttg	acg	aaa	att	cag	cat	agt	tca	cca	gcc	gct	1248
Asp	Arg	Gly	Gly	Asn	Leu	Thr	Lys	Ile	Gln	His	Ser	Ser	Pro	Ala	Ala	
405			410			415										
caa	aat	aac	tac	acg	acg	gat	ata	acg	gtt	tca	aat	cgc	agc	aac	cgc	1296
Gln	Asn	Asn	Tyr	Thr	Asp	Ile	Thr	Val	Ser	Asn	Arg	Ser	Asn	Arg		
420			425			430										
gcg	gta	ctc	agc	aca	ttg	acc	gca	gat	cca	act	caa	gtc	gat	gcc	tta	1344
Ala	Val	Leu	Ser	Thr	Leu	Thr	Ala	Asp	Pro	Thr	Gln	Val	Asp	Ala	Leu	
435			440			445										
ttt	gat	gct	ggg	ggc	cat	caa	acc	agc	ttg	tta	tcc	ggc	caa	gtt	cta	1392
Phe	Asp	Ala	Gly	Gly	His	Gln	Thr	Ser	Leu	Leu	Ser	Gly	Gln	Val	Leu	
450			455			460										
act	tgg	aca	ccg	cga	ggc	gaa	ttg	aaa	caa	gcc	aac	aat	agc	gca	gga	1440
Thr	Trp	Thr	Pro	Arg	Gly	Glu	Leu	Lys	Gln	Ala	Asn	Asn	Ser	Ala	Gly	
465			470			475			480							
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Asn	Glu	Trp	Tyr	Arg	Tyr	Asp	Ser	Asn	Gly	Ile	Arg	Gln	Leu	Lys	Val	
485			490			495										
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Asn	Glu	Gln	Gln	Thr	Gln	Asn	Ile	Pro	Gln	Gln	Gln	Arg	Val	Thr	Tyr	
500			505			510										
cta	ccg	ggg	ctg	gaa	ata	cgt	aca	acc	cag	aac	aac	gcc	aca	aca	aca	1584
Leu	Pro	Gly	Leu	Glu	Ile	Arg	Thr	Thr	Gln	Asn	Asn	Ala	Thr	Thr	Thr	
515			520			525										
gaa	gag	tta	cac	gtt	atc	aca	ctc	ggt	aaa	gcc	ggc	cgc	gct	caa	gtc	1632

Glu	Glu	Leu	His	Val	Ile	Thr	Leu	Gly	Lys	Ala	Gly	Arg	Ala	Gln	Val		
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cga	gta	ttg	cat	tgg	gag	agc	ggt	aaa	cca	gaa	gat	att	aat	aac	aat	1680	
Arg	Val	Leu	His	Trp	Glu	Ser	Gly	Lys	Pro	Glu	Asp	Ile	Asn	Asn	Asn		
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Gln	Leu	Arg	Tyr	Ser	Tyr	Asp	Asn	Leu	Ile	Gly	Ser	Ser	Gln	Leu	Gln		
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tta	gat	agc	gac	gga	caa	att	atc	agt	gaa	gaa	gaa	tat	tat	cca	ttt	1776	
Leu	Asp	Ser	Asp	Gly	Gln	Ile	Ile	Ser	Glu	Glu	Glu	Tyr	Tyr	Pro	Phe		
						580		585				590					
ggg	ggg	aca	gca	ctg	tgg	gca	agg	aat	caa	acc	gaa	gcc	agc	tat		1824	
Gly	Gly	Thr	Ala	Leu	Trp	Ala	Ala	Arg	Asn	Gln	Thr	Glu	Ala	Ser	Tyr		
						595		600			605						
aaa	acc	att	cgt	tat	tct	ggg	aaa	gag	cgg	gat	gtt	acc	ggg	ctg	tat	1872	
Lys	Thr	Ile	Arg	Tyr	Ser	Gly	Lys	Glu	Arg	Asp	Val	Thr	Gly	Leu	Tyr		
						610		615			620						
tat	tat	ggc	tac	cgt	tat	tac	caa	ccg	tgg	gca	ggc	aga	tgg	tta	ggg	1920	
Tyr	Tyr	Gly	Tyr	Arg	Tyr	Tyr	Gln	Pro	Trp	Ala	Gly	Arg	Trp	Leu	Gly		
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gca	gac	ccg	gca	gga	acc	att	gat	gga	ctg	aat	tta	tat	cgc	atg	gtg	1968	
Ala	Asp	Pro	Ala	Gly	Thr	Ile	Asp	Gly	Leu	Asn	Leu	Tyr	Arg	Met	Val		
						645		650			655						
aga	aat	aac	ccg	gtg	acg	caa	ttt	gat	gtt	cag	gga	tta	tca	ccg	gcc	2016	
Arg	Asn	Asn	Pro	Val	Thr	Gln	Phe	Asp	Val	Gln	Gly	Leu	Ser	Pro	Ala		
						660		665			670						
aac	aga	aca	gaa	gca	ata	ata	aaa	cag	ggg	tcc	ttt	acg	gga	atg		2064	
Asn	Arg	Thr	Glu	Glu	Ala	Ile	Ile	Lys	Gln	Gly	Ser	Phe	Thr	Gly	Met		
						675		680			685						
gaa	gaa	gct	gtt	tat	aaa	aaa	atg	gct	aaa	cct	caa	act	ttc	aaa	cgc	2112	
Glu	Glu	Ala	Val	Tyr	Lys	Lys	Met	Ala	Lys	Pro	Gln	Thr	Phe	Lys	Arg		
						690		695			700						
caa	aga	gct	atc	gct	gcc	caa	aca	gag	caa	gaa	gcc	cat	gaa	tca	ttg	2160	
Gln	Arg	Ala	Ile	Ala	Ala	Gln	Thr	Glu	Gln	Glu	Ala	His	Glu	Ser	Leu		
						705		710			715		720				
acc	aac	aac	cct	agt	gta	gat	att	agc	cca	att	aaa	aac	tac	acc	aca	2208	
Thr	Asn	Asn	Pro	Ser	Val	Asp	Ile	Ser	Pro	Ile	Lys	Asn	Tyr	Thr	Thr		
						725		730			735						
gat	agc	tca	caa	att	aat	gcc	gca	ata	agg	gaa	aat	cgt	att	acg	cca	2256	
Asp	Ser	Ser	Gln	Ile	Asn	Ala	Ala	Ile	Arg	Glu	Asn	Arg	Ile	Thr	Pro		
						740		745			750						
gca	gtg	gaa	agt	tta	gac	gcc	aca	tta	tct	tcc	cta	caa	gat	aga	caa	2304	
Ala	Val	Glu	Ser	Leu	Asp	Ala	Thr	Leu	Ser	Ser	Leu	Gln	Asp	Arg	Gln		
						755		760			765						
atg	agg	gta	act	tat	cg	gtg	atg	acc	tat	gta	gat	aat	tcc	acg	cca	2352	
Met	Arg	Val	Thr	Tyr	Arg	Val	Met	Thr	Tyr	Val	Asp	Asn	Ser	Thr	Pro		
						770		775			780						
tcg	cct	tgg	cac	tcg	cca	cag	gaa	gga	aat	agt	att	aat	gtt	ggt	gat	2400	

Ser	Pro	Trp	His	Ser	Pro	Gln	Glu	Gly	Asn	Ser	Ile	Asn	Val	Gly	Asp	
785						790					795					800
atc	gtt	tcg	gat	aac	gct	tat	tta	tca	aca	tcg	gcc	cat	cgt	ggt	ttt	2448
Ile	Val	Ser	Asp	Asn	Ala	Tyr	Leu	Ser	Thr	Ser	Ala	His	Arg	Gly	Phe	
																805
																810
																815
ctg	aat	ttt	gtt	cac	aaa	aaa	gaa	acc	agt	gaa	act	cga	tac	gtc	aag	2496
Leu	Asn	Phe	Val	His	Lys	Lys	Glu	Thr	Ser	Glu	Thr	Arg	Tyr	Val	Lys	
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																825
																830
atg	gca	ttt	tta	acg	aat	gcg	ggt	gtc	aat	gtc	cca	gca	tct	atg		2544
Met	Ala	Phe	Leu	Thr	Asn	Ala	Gly	Val	Asn	Val	Pro	Ala	Ala	Ser	Met	
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																840
																845
tat	aat	aat	gct	ggc	gag	gag	caa	gta	ttt	aaa	atg	gat	tta	aac	gat	2592
Tyr	Asn	Asn	Ala	Gly	Glu	Glu	Gln	Val	Phe	Lys	Met	Asp	Leu	Asn	Asp	
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																855
																860
tca	aga	aaa	agc	ctt	gct	gaa	aaa	tta	aaa	cta	aga	gtc	agt	gga	cca	2640
Ser	Arg	Lys	Ser	Leu	Ala	Glu	Lys	Leu	Lys	Leu	Arg	Val	Ser	Gly	Pro	
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																870
																875
																880
caa	tcg	gga	caa	gcg	gaa	ata	tta	cta	cct	agg	gaa	aca	cag	ttc	gaa	2688
Gln	Ser	Gly	Gln	Ala	Glu	Ile	Leu	Leu	Pro	Arg	Glu	Thr	Gln	Phe	Glu	
																885
																890
																895
gtt	gtt	tca	atg	aaa	cat	caa	ggc	aga	gat	acc	tat	gta	tta	ttg	caa	2736
Val	Val	Ser	Met	Lys	His	Gln	Gly	Arg	Asp	Thr	Tyr	Val	Leu	Leu	Gln	
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																905
																910
gat	att	aac	caa	tcc	gca	gcc	act	cat	aga	aat	gta	cgt	aac	act	tac	2784
Asp	Ile	Asn	Gln	Ser	Ala	Ala	Thr	His	Arg	Asn	Val	Arg	Asn	Thr	Tyr	
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																920
																925
acc	ggt	aat	ttc	aaa	tca	tcc	agt	gca	aat	taa						2817
Thr	Gly	Asn	Phe	Lys	Ser	Ser	Ser	Ala	Asn							
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Val	His	Asp	Asn	Arg	Gly	Leu	Ala	Ile	Arg	Asn	Ile	Ser	Phe	His	Arg	
					20				25			30				
Thr	Thr	Ala	Glu	Ala	Asn	Thr	Asp	Thr	Arg	Ile	Thr	Arg	His	Gln	Tyr	
					35				40			45				
Asn	Ala	Gly	Gly	Tyr	Leu	Asn	Gln	Ser	Ile	Asp	Pro	Arg	Leu	Tyr	Asp	
					50				55			60				
Ala	Lys	Gln	Thr	Asn	Asn	Ala	Val	Gln	Pro	Asn	Phe	Ile	Trp	Arg	His	
					65				70			75			80	

Asn Leu Thr Gly Asn Ile Leu Arg Thr Glu Ser Val Asp Ala Gly Arg
 85 90 95
 Thr Ile Thr Leu Asn Asp Ile Glu Gly Arg Pro Val Leu Thr Ile Asn
 100 105 110
 Ala Ala Gly Val Arg Gln Asn His Arg Tyr Glu Asp Asn Thr Leu Pro
 115 120 125
 Gly Arg Leu Leu Ala Ile Ser Glu Gln Gly Gln Ala Glu Glu Lys Thr
 130 135 140
 Thr Glu Arg Leu Ile Trp Ala Gly Asn Thr Pro Gln Glu Lys Asp His
 145 150 155 160
 Asn Leu Ala Gly Gln Cys Val Arg His Tyr Asp Thr Ala Gly Leu Thr
 165 170 175
 Gln Leu Asn Ser Leu Ala Leu Thr Gly Ala Val Leu Ser Gln Ser Gln
 180 185 190
 Gln Leu Leu Thr Asp Asn Gln Asp Ala Asp Trp Thr Gly Glu Asp Gln
 195 200 205
 Ser Leu Trp Gln Gln Lys Leu Ser Ser Asp Val Tyr Ile Thr Gln Ser
 210 215 220
 Asn Thr Asp Ala Thr Gly Ala Leu Leu Thr Gln Thr Asp Ala Lys Gly
 225 230 235 240
 Asn Ile Gln Arg Leu Ala Tyr Asp Val Ala Gly Gln Leu Lys Gly Ser
 245 250 255
 Trp Leu Thr Leu Lys Gly Gln Ala Glu Gln Val Ile Ile Lys Ser Leu
 260 265 270
 Thr Tyr Ser Ala Ala Gly Gln Lys Leu Arg Glu Glu His Gly Asn Gly
 275 280 285
 Ile Val Thr Glu Tyr Ser Tyr Glu Pro Glu Thr Gln Arg Leu Ile Gly
 290 295 300
 Ile Thr Thr Arg Arg Pro Ser Asp Ala Lys Val Leu Gln Asp Leu Arg
 305 310 315 320
 Tyr Gln Tyr Asp Pro Val Gly Asn Val Ile Ser Ile Arg Asn Asp Ala
 325 330 335
 Glu Ala Thr Arg Phe Trp Arg Asn Gln Lys Val Ala Pro Glu Asn Ser
 340 345 350
 Tyr Thr Tyr Asp Ser Leu Tyr Gln Leu Ile Ser Ala Thr Gly Arg Glu
 355 360 365
 Met Ala Asn Ile Gly Gln Gln Ser Asn Gln Leu Pro Ser Pro Ala Leu
 370 375 380
 Pro Ser Asp Asn Asn Thr Tyr Thr Asn Tyr Thr Arg Thr Tyr Thr Tyr
 385 390 395 400
 Asp Arg Gly Gly Asn Leu Thr Lys Ile Gln His Ser Ser Pro Ala Ala
 405 410 415
 Gln Asn Asn Tyr Thr Asp Ile Thr Val Ser Asn Arg Ser Asn Arg

420	425	430
Ala Val Leu Ser Thr Leu Thr Ala Asp Pro Thr Gln Val Asp Ala Leu		
435	440	445
Phe Asp Ala Gly Gly His Gln Thr Ser Leu Leu Ser Gly Gln Val Leu		
450	455	460
Thr Trp Thr Pro Arg Gly Glu Leu Lys Gln Ala Asn Asn Ser Ala Gly		
465	470	475
Asn Glu Trp Tyr Arg Tyr Asp Ser Asn Gly Ile Arg Gln Leu Lys Val		
485	490	495
Asn Glu Gln Gln Thr Gln Asn Ile Pro Gln Gln Gln Arg Val Thr Tyr		
500	505	510
Leu Pro Gly Leu Glu Ile Arg Thr Thr Gln Asn Asn Ala Thr Thr Thr		
515	520	525
Glu Glu Leu His Val Ile Thr Leu Gly Lys Ala Gly Arg Ala Gln Val		
530	535	540
Arg Val Leu His Trp Glu Ser Gly Lys Pro Glu Asp Ile Asn Asn Asn		
545	550	555
Gln Leu Arg Tyr Ser Tyr Asp Asn Leu Ile Gly Ser Ser Gln Leu Gln		
565	570	575
Leu Asp Ser Asp Gly Gln Ile Ile Ser Glu Glu Glu Tyr Tyr Pro Phe		
580	585	590
Gly Gly Thr Ala Leu Trp Ala Ala Arg Asn Gln Thr Glu Ala Ser Tyr		
595	600	605
Lys Thr Ile Arg Tyr Ser Gly Lys Glu Arg Asp Val Thr Gly Leu Tyr		
610	615	620
Tyr Tyr Gly Tyr Arg Tyr Tyr Gln Pro Trp Ala Gly Arg Trp Leu Gly		
625	630	635
Ala Asp Pro Ala Gly Thr Ile Asp Gly Leu Asn Leu Tyr Arg Met Val		
645	650	655
Arg Asn Asn Pro Val Thr Gln Phe Asp Val Gln Gly Leu Ser Pro Ala		
660	665	670
Asn Arg Thr Glu Glu Ala Ile Ile Lys Gln Gly Ser Phe Thr Gly Met		
675	680	685
Glu Glu Ala Val Tyr Lys Lys Met Ala Lys Pro Gln Thr Phe Lys Arg		
690	695	700
Gln Arg Ala Ile Ala Ala Gln Thr Glu Gln Glu Ala His Glu Ser Leu		
705	710	715
Thr Asn Asn Pro Ser Val Asp Ile Ser Pro Ile Lys Asn Tyr Thr Thr		
725	730	735
Asp Ser Ser Gln Ile Asn Ala Ala Ile Arg Glu Asn Arg Ile Thr Pro		
740	745	750
Ala Val Glu Ser Leu Asp Ala Thr Leu Ser Ser Leu Gln Asp Arg Gln		
755	760	765

Met Arg Val Thr Tyr Arg Val Met Thr Tyr Val Asp Asn Ser Thr Pro
770 775 780

Ser Pro Trp His Ser Pro Gln Glu Gly Asn Ser Ile Asn Val Gly Asp
785 790 795 800

Ile Val Ser Asp Asn Ala Tyr Leu Ser Thr Ser Ala His Arg Gly Phe
805 810 815

Leu Asn Phe Val His Lys Lys Glu Thr Ser Glu Thr Arg Tyr Val Lys
820 825 830

Met Ala Phe Leu Thr Asn Ala Gly Val Asn Val Pro Ala Ala Ser Met
835 840 845

Tyr Asn Asn Ala Gly Glu Glu Gln Val Phe Lys Met Asp Leu Asn Asp
850 855 860

Ser Arg Lys Ser Leu Ala Glu Lys Leu Lys Leu Arg Val Ser Gly Pro
865 870 875 880

Gln Ser Gly Gln Ala Glu Ile Leu Leu Pro Arg Glu Thr Gln Phe Glu
885 890 895

Val Val Ser Met Lys His Gln Gly Arg Asp Thr Tyr Val Leu Leu Gln
900 905 910

Asp Ile Asn Gln Ser Ala Ala Thr His Arg Asn Val Arg Asn Thr Tyr
915 920 925

Thr Gly Asn Phe Lys Ser Ser Ser Ala Asn
930 935